

CON  
DON'T TAKE WASTE

LYNN Mobe 3

136 time; 46

Well, people are just not willing to have nuclear waste in their backyard and rightly so. But ~~it's~~ at some point we have to take a position, you know, to be responsible for the waste we've created. But until, but until we get enough public awareness of the dangers of having it in our own backyard..! that's the place to begin, I think, to help educate people...and then once the government sees the people are not willing to have this in their yards, in their own cities...then we take a turn and try to figure out the best solution for that. <sup>37</sup> And I think the Mobilization position is that we need to work on ~~it's from the perspective of the~~ that aspect of no one, of no one accepting it in the...

## TAILINGS

263

Cochran (#3 Hannon ethics) x270 time: 37

The fairest allocation of the benefits and the risks when you when those people are not there to voice their preference is to be neutral to those people...so the benefits and risks are neutral...so to be neutral to future generations implies that their risks from activities related to the processing and use of uranium and production of waste are no more than they would have been if we'd left the uranium ore bodies in place.



## PROBLEM OF WASTE DISPOSAL

Lash (Lash interview) 237 time: 11

Then we also have this problem of waste disposal. I'm hopeful that we can find a satisfactory way of disposing of existing waste, but given the extreme difficulty in so far in fact the impossibility of finding a single site for safely disposing of waste... I think it's unlikely that in the coming decades we'll be able to find many---a dozen, two dozen, three dozen sites for disposal with increasing amounts of radioactive waste.

250 I think the WIPP site is ill considered and undesirable and in fact we won't have it. And I think it's too bad we continue to spend tens of

Nuclear power: the power behind the atom bomb, the element in the nuclear reactor which creates energy but which might also supposedly melt down deep into the heart of the earth: the famed China Syndrome... and a known cause of that mysterious disease: cancer.

bite: Hanna--bomb

Representative Hanna is right--no deaths have been pinned directly on nuclear power plants--but 3 mile island was a frightening experience ---and the industry came under close scrutiny by the public for the first time since Hiroshima.

One of the things the public discovered was ~~nuclear waste~~ the problem of nuclear waste. What do you do with the ~~leftovers from this~~ lethal leftovers of the nuclear industry.

Nuclear waste is building up at an incredible rate. ~~There's 155 million tons of~~ There's high level waste: highly radioactive liquids, and spent fuel cores: 70 million gallons of the liquid, and 5 thousand metric tons of used up fuel elements--but there's also 66 million cubic feet of lower level waste--things like the work gloves and tools used near the radioactive source---and there's 155 million tons of radioactive tailings left behind on the spots where they dug up the uranium to power the industry in the first place. And the tailings are no small problem: bite: rassmussen.

The government has been trying to solve the problem of nuclear waste all along--but after 3 mile island, more people became concerned and the problem went public: bite (ohen.

What came to light was the governments ineffectiveness at solving the problem.

gas problems:  
Salt Lake  
leaky casks  
Tyson, Kansas



[REDACTED]

Cecil Tuck  
c/o Ron Riden  
ktvk  
[REDACTED]  
[REDACTED]

Dear Cecil:

Ron told me that one of your first official actions after taking over as News Director will be to pick a new Producer. I'm looking for a producing job and Ron thought you might take a look at my tape.

I started in television as an intern for the Consumer reporter at KCST-TV in San Diego, California. He was a local politician who had no TV experience so I became his field producer: helping to supervise research, filtering story ideas, setting up interviews, and helping him write and edit.



and when all of this showed up, many began to feel the government had been lying to them: bite: (Cochran, Wilcox, Roxanne

certainly, the government had had its problems. But many of the scientists insist there really isn't much of a problem. bite: (Cohen (time), Gordon: cleaning environment. (may here we want to compare with coal)

and the scientists ~~begin exploring the~~ pointed to some of the options they had come up with for neutralizing the problem of nuclear waste. (disposing of the waste?) Some of the solutions have the aura of science fiction: loading waste on to rockets and sending it ~~so~~ into deep space, or packing it into containers and setting it on the polar icecap...scientists here figured that one of the problems with waste is that it generates heat, so they reasoned that heat would melt through the ice cap and go deep into the ice--which would freeze up behind it. Another suggestion--take it to the deepest part of the ocean and dump it--the ocean is already slightly radioactive and more wouldn't hurt because it would be diluted by the great mass of water.

~~None of these alternatives found much support~~ Scientists also suggested transmutation. Far back in history alchemists claimed they could turn lead into gold by the process of transmutation... modern scientists say they might be able to find a way to transmute nuclear waste to something less harmful--someday.

Two of the options scientists came up with are much more prosaic and much more practical. They suggested taking much of the most dangerous stuff and re-processing it. That would mean less need for new uranium, so less tailings...and less need to store the spent but still dangerous material. bite: last breeders, bite : deutsch-policy so that alternative was set aside.

That left underground storage. scientists figured they could come up with a safe state to put the used uranium in: maybe glassifying it--and then storing it underground. Salt ~~layers~~ deposits, they thought, might be a suitable place to store the glasslike waste: bite: cohen-time and they decided on a first experimental site to test this theory. Carlsbad, New Mexico--~~where there was~~ and it would



be called WIPP--waste isolation pilot plant. ~~But~~ many in New Mexico, a state which depends heavily on the nuclear industry and has been the site for most of the us bomb testing--agreed that this would be an excellent project: bite; Mayor, bite: scientist from Hannan but others weren't so sure: they wanted the right to say no bite: ethics conf and to make sure they didn't get into something they weren't fully informed on bite:

the issue of state's rights



I also did a lot of general assignmet



Roger Burnham

WCKT

April 9, 1980

Dear Roger:

It was good to talk to you again, you gave me so many leads on my survey of other investigative units. I'm delighted to hear you are in need of a Consumer reporter. I have always argued that, as much trouble as the position is, it is a vital service and good viewer draw.



Texas and New Mexico have always been hospitable to the nuclear industry. Much ~~of the~~ uranium is mined in the two states, and there are many defense installations which produce nuclear components for the military in ~~the~~ Texas and New Mexico.

Three of those installations: Pantex near Canyon, Texas, and Los Alamos and Sandia in New Mexico ~~have been successful~~ also have storage areas for low level waste: the tools and clothing used by workers ~~which~~ which become contaminated and have to be disposed of.

Another commercial company in Texas, Todd Research Co, was a processing plant which contracted to take in commercial waste from other places and store it temporarily in 55 gallon drums on Pelican Island until it could be transported to a burial site in Beatty, Nevada.

The installation stopped accepting contracts in February of 1980, and hopes to have fulfilled all its contracts and cleaned out the storage facility by May of 1981---except for the waste they themselves generate.

There are also 7 other ~~the~~ energy brokers in Texas, who contract to pick up waste from hospitals and other commercial users of nuclear materials. These companies store ~~the~~ the waste temporarily until space for it can be found in storage areas outside the state.

Two nuclear power plants are also set to come on line in Texas. Comanche Peak, about 80 miles northwest of Dallas, is expected to begin operation in 1981. \_\_\_\_\_ will be on line by 1983 if everything goes according to schedule. The nuclear power plants use a highly radioactive fuel rod to create their power---and ~~after~~ each year about 65 of them have to be replaced. The reactors are designed to be able to store all the used fuel rods through 1989--and possibly longer.

An experimental long term storage facility is planned for somewhere in the United States. The most likely site is just over the Texas border, in Carlsbad, New Mexico. The project planned for that area is called WIPP--waste isolation

Nuclear waste would be stored deep in salt formations in the earth. Many studies have shown that salt may be a good medium to store the hot wastes---one big advantage is that it seals itself if there



pro

con

transportation

gov trust/sale

public pressure

bomb image

not a problem

weapons testing

good for environ

gov 10 but  
time

transportation

fears

polit effed

bureaucracy

don't take waste

no sites

public hearing

6 opponents

9 of course

11 - one org

4 but says

1.

2. Sci say

3 that they're

BA and  
some say  
they'll be  
more than  
safe

Neutral

12 and a  
shuts a  
major  
concern

tailings.

state's rights

breeder reactor

long term / polit prob

regulations

transportation

in the TX-NM  
area

1 and  
certainly  
8 attempts  
being made  
to set up  
1985 so  
safe



Hook

what is nuclear waste // what can it do

why are people afraid of it // <sup>current solutions</sup> government screw ups // bite on danger of institutions

possible solutions

state's rights

government actions // WIPP // Carter's new plan

Hook

what is nuclear waste: alpha, gamma, beta, types of waste, *tailings*

what can the waste do: cause cancer, affect future generations, provide plutonium

why are people afraid of it: cancer, song from tape, mistaken belief of

possible explosion i.e. China Syndrome, government lying to them (bite)

current solutions: places and types of storage, types of treatment: saltcake, etc.

*transportation*  
government screw ups: those solutions and their flaws,

possible solutions: more temporary facilities, entombment or burial,

geological repositories, ocean floor or arctic ice sheets, deep space,

*transmutation, reprocessing*  
cost—how much \$ to be safe How long it's dangerous  
state's rights vs government actions: danger of institutions (bite), WIPP

example

Carter's new plan

Citizen involvement



(shot of bomb at Hiroshima)

If all nuclear waste came from bombs, we wouldn't have to worry about disposing of it. ~~most much~~ But ~~lot~~ <sup>most</sup> of the waste comes from equipment used to save lives and to enhance them. (Shots of nuke pharmacy, power plant/on electric light). ~~between defense & commercial uses~~ And there's a lot of nuclear waste accumulating.

there's  
the tailings  
left over  
when  
uranium  
is dug up.  
bite 1 1/2 mile  
tons of it

~~Stats~~  
The government is trying to decide what to do with it, so that we can ~~benefit~~ benefit from the good of nuclear power, and not suffer from its ill effects.

and there's  
the low  
level waste  
- contaminated  
work gloves,  
tools & other  
slightly  
radioactive  
residue -  
66 mil cubic  
feet

everyone has heard of the bad side effects of ~~nuclear~~ radiation-- prolonged exposure ~~to radiation~~ can alter the body cells: causing

cancer, genetic mutation and even death. Those side effects come from the same special properties of uranium which allow it to produce energy. bite-bomb

Not everyone agrees that nuclear energy is safe - explanation of the process/alpha, beta and gamma particles because of the growing problem of w

and more  
deadly  
stuff -  
10 mil gal  
of highly  
radioactive  
liq. waste  
& 5 than  
metric tons  
of used up  
nuclear  
reactor fuel

everyone can agree that we need ~~the good things~~ ~~nuclear~~ energy--what everyone cannot agree on is what ~~they~~ they are willing to risk to get ~~the~~ ~~benefits~~ it.

bite #3, #4 coal 10x more dangerous than nuke power  
in the case of nuclear power, more people might be willing to support it if they could be assured that it wouldn't some day blow up ~~thin~~ their faces.



And if WIPP gains final approval--can Texans breathe a sigh of relief that the installation is safely across the border? Not really. If salt proves a safe medium, another possible site is in the Palo Duro Basin--which also has large salt deposits. <sup>near Compton TX or the East TX Salt Basin</sup>

But there it's possible that nuclear storage could interfere with the water supply---always a major concern in dry west Texas. <sup>In East TX Residents in geon held press + meetings</sup>  
bite: wilcox The Permian Basin has also been suggested as (news on the  
another site---but there the rich deposits of oil may prevent any storage of waste. In fact, any area rich in minerals would be a poor choice for storage--since later generations might try to mine them and unknowingly invade the storage site--exposing themselves to radiation and allowing it to escape to the biosphere where it could contaminate food, water or the air.

And even if neither site in Texas is chosen, trucks ~~transporting~~ and trains transporting nuclear materials to the WIPP site would still have to cross Texas--with potential dangers of leakage or accidents ~~along~~ along the way. Bite: Nathanson, biet:

In fact, the dangers of transporting waste is a positive argument for a centrally located Texas has attempted to protect itself by establishing TENARC-- <sup>safe burial site</sup>  
a committee of professionals set up to protect Texas' interest ~~where~~ during federal site evaluation process. Included on the committee are people with technical and policy expertise



Bite: song

Nuclear power is coming to Texas--and many people aren't happy about that. In their minds nuclear power creates images of the atom bomb, the movie the China Syndrome which showed a nuclear power plant disaster which supposedly could end the world, and a known cause of that mysterious disease: cancer.

Some People in Texas have fought to keep nuclear plants out of the state---and in Austin a referendum which would have allowed the city to draw part of its power from a nuclear source ~~it~~ was soundly defeated.

Attempts to occupy both sites

manipulation for survival  
armadillo alliance

South TX Project 83-85  
Houston

Allen's Creek Unit  
no permit near Houston Matagorda

Nevertheless, 2 nuclear powerplants are scheduled to go on line ~~within the next 5 years~~ Comanche Peak in 1981 and ~~Chalk Bluff~~ <sup>Chalk Bluff</sup> in 1984. And this has brought the public's attention to the nuclear industry and all of its problems. ~~in Texas~~ People who saw the government reaction at 3 Mile Island are unwilling to have that scene duplicated in Texas or New Mexico. bite: wilcox and...while proponents recognize public fears, they maintain it's a safe source of power.

bite: hanna  
and certainly when compared w/ coal & some other energy sources - this energy looks good - bite

But it is not nuclear energy that may be the real problem in Texas and New Mexico, <sup>it is</sup> but nuclear waste and where to put it. Country wide it's building up at an incredible rate. There's high level waste: highly radioactive liquids and spent fuel cores: 70 million gallons of the liquid, and 5 thousand metric tons of used up fuel elements--but there's also 66 million cubic feet of lower level waste--things like thw work gloves and tools contaminated because they were used near a radioactive source.-----and theres 155 million tons of radioactive tailings left behind on the ~~spots~~ when the uranium has been mined--a great pile of that in Texas and New Mexico.

bite: tailings Foster  
get tailings have never been classified as nuclear waste. They are allowed to be forgotten after they are cooled over

The nuclear waste that's liable to end up in our states is not only the result of ~~nuclear~~ commercial nuclear energy projects--much of it comes from defense projects. There are already 3 sites in the 2 states just for storage of low level waste: Pantex, Sandia nd Los Alamos. and neither the state nor the AEC have any control over defense wastes.

more detail  
+ figs  
+ x +  
NM

But some anti-nukes say it's not a problem--the waste w/ the energy generated along w/ the power  
bite: hash

Not only do we have mill tailings, but

power plants-on site storage 1989



Texas had at least one comm. storage site

~~On~~ And Pelican Island, has been used to store low level waste from ~~has been~~  
~~stored in drums above ground. now~~  
commercial sources--although that facility ~~has~~ expects to have sent almost all  
of its radioactive waste for burial in Beatty, Nevada by May of 1981.

But there are also 7 more storage brokers in Texas--who take in comm. waste  
and store  
it temporarily ~~for~~ long time. What has brought the matter to public attention again  
until it can  
be sent to a  
burial site.  
Texas and New Mexico have been living with these conditions for a  
names  
is the possibility of storing waste from all over the country in  
a site in Carlsbad, New Mexico or in the Palo Duro Basin near Canyon,  
Texas.

with the build up in the use of nuclear materials in  
medicine, defense & power generation  
The government, in an effort to find some permanent storage space  
has made  
for radioactive waste, came up with two alternatives: re-processing  
spent high level fuel rods ~~and~~ or storing the radioactive material  
deep underground in some sort of medium which would not let any  
radioactivity leak to where it could contaminate man through his  
food, drink or the air he breathes. until the radioactivity  
no longer has vital side effects

President Carter opposed the <sup>cost & energy efficient</sup> idea of re-processing because  
that process creates plutonium as a by-product. Plutonium is  
an essential ingredient in ~~an~~ atom bombs--and the President was  
afraid it would become too accessible to small countries or  
terrorist groups if the re-processing plants were allowed. So,  
in 1977 he ~~stopped~~ closed down that alternative. bite: o'Leary

Deep geologic storage remained a viable option. Bites:  
and one of the most <sup>promising</sup> researched mediums for storage <sup>appears to be</sup> is salt. both  
Texas and New Mexico have large salt deposits...and the government  
decided it would ~~try~~ research the idea of storing waste by establishing  
a pilot project. The chosen site was near Carlsbad--and the project  
was named WHIPP--Waste Isolation Pilot project/

But then came the controversy. Conflicts over state's rights  
bite: Lash, bite: Gordon Mayor of Carlsbad, bite: etichics guy,  
bite: Gordon--cleaning up environment And conflict on whether salt  
was indeed the right medium to safely store the waste. Bites:

several  
million  
dollars  
had been  
spent,  
some even  
suggested  
salt might  
not be the  
ideal  
medium



slowly for those outside  
this market. The male  
anchor looks clean cut  
but has an odd inflection  
pattern



and while sci were arguing that angle,  
The situation was not helped because the government changed its mind about the waste which would be test-stored at WIPP several times as the project developed. First they indicated it would be purely low level defense waste, then they suggested putting in some high level waste, and then it became a possibility that commercial waste would be stored there. Not only that, but many people were confused by what they <sup>now</sup> called temporary---time spans for the test ranged from 10 to 20 to more years.

And time is certainly one of the biggest conflicts of all in the nuclear waste ~~problem~~ controversy. Some scientists say that the storage need only be safe for a relatively short period of time--5-600 years---short, that is, when the half life of some of the radioactive elements being stored run up into the thousands of years. bite: when---anti'nuclear spokesmen disagree vehemently ~~now~~ bite: Lash

Proponents of salt storage say that it will safely contain the radioactivity for the 5-600 years they say will neutralize it---opponents say that salt has too many flaws---there are cracks and fissures through which radiation might escape, pockets of a salt/water solution or brine which might escape because of the tremendous heat of storing nuclear waste---leaking down to corrode the storage tanks which contain the nuclear material. Proponents say that with all its flaws, a test facility is necessary bite: opponents say they don't want any testing until all the problems have been solved bite:

<sup>But</sup> And perhaps the biggest sticking place of all<sup>is</sup> who has the right to say whether a nuclear waste disposal site should be installed: the state in which it will go, or the federal government? Several states have already passed laws forbidding any sites within their boundaries--but neither Texas nor New Mexico has such a law. (Experts say the law might be useless anyway, since the courts might allow federal statutes to supersede state laws.) <sup>and there are separate economic and moral arguments for allowing a disposal site.</sup> Nor is it a clear cut issue---it is not environmentalists against scientists--on state and local government against the feds. The mayor of Carlsbad sees the jobs it could add to the economy of his community--and backs WIPP bite: mayor, ~~Dr.~~ Terry Lash however, strongly opposes any nuke waste installation on the basis of state's rights: Las bite <sup>bite: store own stuff</sup> Scientists, like Dr. Gordon say that disposal sites are not really negative---bite: Gordon (cleaning up environ) but others say they just want the right to decide what is going to intimately affect them and their children bites: ethics workshop, rally. <sup>bite: not a dumping ground.</sup>



~~And this could be important~~ Two other sites have been considered--  
salt beds in the Palo Duro Basin and in the piney woods of East  
Texas. If salt is the chosen storage medium, either of these  
could be potential storage areas.

~~Texas has now been directly relating to nuclear waste disposal~~

one almost made it through the 66th legislature and will probably  
pass during the next session according to legislative sources.

The bill authorizes the health department to acquire  
storage sites and operate them itself or lease them to private firms  
operating under department supervision.



Who will get custody?

Is it safe?

Will <sup>with</sup> Refs or Eastern New Mexico  
get custody?

Congress now

Time is running out - We can't  
afford to



~~We live in a polluted society.~~

one of the Top 31 <sup>INSTITUTIONAL</sup> radioactive waste producing  
Texas is now ~~growing~~ states in the nation.

"Toxic Texas?"

We live in on a radioactive planet

~~Texas~~ are afraid of nuclear wastes

~~The public is~~

~~Most of us~~

We have a healthy respect for radioactivity

There are tremendous quantities of radioactive wastes in existence today. Some of it is in Texas.

How much? , Where,

~~We live on a radioactive planet.~~

[Nobody Wants somebody else's garbage - especially if its radioactive. ~~So what are we willing to do with~~ Texas is no exception. ~~We don't have~~ We've got our own rad waste 1,360 of it from institutions





So what are we doing with  
~~the~~ 30 years worth of <sup>it</sup> ~~military and~~  
nuclear waste from our ~~weapons~~  
~~the~~ military ~~defense~~ programs and  
commercial nuclear power industry

Problem isn't ~~somebody~~ just who gets  
it - but what do they do with it.

And ~~notbody~~ But everybody else  
want to ~~be sure~~ know for sure they're  
safe They do want to know  
is it safe?

So eleven states have banned the  
disposal of nuclear waste <sup>within their borders</sup> before  
hasn't ~~only~~ probably won't  
~~be~~

Nobody won't radioactive garbage  
buried in their community

So who's will <sup>get</sup> ~~end up~~ sustained  
with custody of our 30 year  
legacy of nuclear waste in the  
U.S? ~~Maybe~~ ~~later~~

So who's willing to <sup>take</sup> ~~keep~~ custody  
of our 30 year legacy of nuclear  
waste?

So what do we do with ~~our~~ 30 years  
worth of radioactive waste generated ~~from~~ by  
military programs and the nuclear power  
industry?



Topic Texas =

~~These~~ folks don't want ~~it~~

~~There are folks in Texas who oppose~~

Not all Texans like what's  
happening here and in Eastern  
New Mexico

~~The~~ ~~Nuclear~~ ~~Waste~~ wants so-called dry  
garbage - especially if it  
- radioactive... And we don't  
want it handled carelessly - no matter whose  
it is, disposed of

Texas & New Mexico are  
possible exceptions

many of us ~~We~~  
~~People~~ ~~are~~ worried about  
the ~~possibility~~ ~~of~~ ~~transportation~~  
accidents, ~~the~~ ~~way~~ ~~about~~ ~~the~~ ~~public~~ ~~health~~  
~~the~~ ~~risks~~ ~~of~~ ~~radiation~~ ~~exposure~~ ~~and~~ ~~cancer~~.

We fear the  
contamination of ~~our~~ ~~community~~ air, ~~land~~ ~~and~~ ~~water~~.  
The chance ~~that~~ of contamination of  
our ~~community~~ air, ~~land~~ ~~and~~ ~~water~~.

~~But~~ ~~And~~ ~~realistic~~ ~~are~~ ~~but~~ ~~feared~~

But are we being realistic?

~~But~~ ~~Further~~ ~~we~~ ~~are~~



Folks in Texas are worried  
about radioactive wastes  
coming to end through our  
state. 0

There is a good chance that  
Texas and New Mexico will  
be nuclear waste dump sites

The Southwest

{ indirectly  
proposed  
evidence

~~Texas and New Mexico~~ have always  
been hospitable to ~~the~~ nuclear  
~~activities~~ ~~radioactivity~~



"Topic Topics"

Nobody wants somebody else's garbage, especially if it's radioactive.

So who ~~will~~ getting custody of our radioactive ~~nuclear~~ waste

So what do we do with 30 years worth of radioactive waste generated by ~~the~~ <sup>our</sup> military programs and nuclear power plants?

In fact, ~~about~~ even ~~the~~ some of the people who create it don't want it and nobody wants

~~But~~ ~~Why~~ ~~not~~ -

That has been the dividing us in to camps

Those who know are angry

People are pretty angry ~~hot~~

Most of the people we talk to are angry, or frustrated and afraid. They are all ~~some~~ ~~many~~



~~Mr. Neil / Fisher~~ kept on  
nude pic w/ see O'Leary  
enamor. Montague  
Ralph Sapp

Consumer Info - DOE's role in nude police  
unlabeled 60 min

film Brown's Ferry Refueling  
" " Unloading unit  
unlabeled 20 min

Schmitt

Kennedy

Malow & Heslie

Battelle - waste mgmt options

Josh -

workshop gva. Josh & Oker

Poll

transcript

Sen Schmitt speech

\* indiv interviews in Carlisle

Scene club

\* ✓ mayor of Carlisle

Josh

whshop: Josh &

Ethics workshop

Cochran

Gordon

Rasmussen

Hamilton



WPP

\* DT Scheuler

Foster

Jos Alamos dump / phy

\* DI Mehan

\* SW Research

\* Jeff Nathanson. transport PWT1

3 labs in Sandra

Hanna - TX leg capital shob

\* Mobe 3

TEAL Gordon

Blake - bad audio

Note survival radiation sensor

note - Sydney, Pi 172 (weak audio)

WPP drilling

5 full scale cash tests

Martin Wupack - TX Dept of Health

Rondall City

Austin Cone samples

TEAC hearing

\* DI Fisher, Weismund

\* Weant (Sandra)

Jefferson " + transportation

W Foster

Waste Lab Jos Alamos

Pilly (noisy audio)

keese - mob survival

Carlsbad scenery

Rantedner ?

film



Nobody wants somebody else's  
garbage - especially if it's radio-  
active.

And we don't want ~~it~~ it  
disposed of carelessly - no matter  
whose it is.

In fact some folks ~~think~~  
won't ~~be created~~ <sup>radiation</sup> us to stop ~~the~~ <sup>generating</sup>  
radioactive waste ~~generation~~ altogether.

So ~~we're faced with~~ what do  
we do with 30 years of nuclear  
waste generated by our military  
programs and nuclear power plants?

So  
Who will get custody? ~~What will~~  
~~be safe?~~ ~~they~~  
~~It looks like~~

~~How will they handle it? Will~~  
~~everybody be safe? Will it be handled~~  
~~safely?~~

Will they <sup>keep</sup> ~~handle~~ it safely?

~~Should that~~

But that won't solve the  
problem <sup>we're facing</sup> ~~now~~ ~~today~~ ...

How and where do we dispose of  
30 years worth of nuclear wastes from  
our military programs and nuclear  
power plants?

Who gets custody? Will it be safe?



At first glance -

From the outside I like the  
While a other ~~is~~ nucleon  
waggle ~~is not~~ ~~the first~~  
is dispropable,

1

While for others ~~the~~ waste  
time is a

I have a question of  
~~transfer~~ - responded to  
 believe

Other factors, ~~the~~ <sup>believe</sup> ~~concerns~~ <sup>is</sup> that nuclear waste  
like the Texas  
Energy Adv. Council, can be disposed of safely, with  
no serious public health and safety  
or environmental effects.

and

AUSTIN GROUP.

For them the  
question of risk  
~~must be~~ is

They ~~weigh~~ <sup>balance</sup> ~~the~~ <sup>risks</sup> what they  
consider are acceptable risks  
against clear benefits.  
They see the <sup>delay of</sup> ~~disposal~~ <sup>for</sup> question of  
a bottleneck ~~or~~ <sup>of</sup> ~~supply~~ <sup>supply</sup> ~~growth~~ <sup>growth</sup>  
~~whose continued~~ <sup>stalling</sup> in a no risk free  
world

For them, further delay ~~of~~ waste disposal ~~is~~ jeopardizes <sup>only</sup> ~~the~~ future growth and security as a nation. <sup>conspicuous</sup>



has been  
The result is confrontation, with much  
of the Waste Temp close to the  
The eye of the storm

temporarily isolated  
at one military

(2) The problem is what to do with <sup>more than</sup> 30  
years of nuclear garbage. Highly toxic,  
radioactive, <sup>temporarily</sup> now stored as defense  
wastes in <sup>storage in</sup> steel drums and tanks (some  
~~absolutely~~ leaking) <sup>at military sites</sup> and as <sup>used up</sup> spent fuel rods  
(~~tons~~ of tons at ~~nuclear power~~  
~~plant cooling ponds~~ reactor cores  
stacking up ~~at~~ in cooling ponds at  
some 126 nuclear power plants in the US.

(1) The question of how to permanently dispose  
of nuclear waste is bitterly dividing us.

(2) The problem is what to do with more <sup>extremely</sup>  
than 30 years of nuclear garbage. It's Hot,  
It's All of it is highly radioactive ~~and~~ much of it <sup>is</sup> ~~will~~ and  
some of it <sup>will</sup> be lethally potent for thousands of years.

(3) Lots of it comes from our military defense & weapons  
programs - more and more of it is <sup>stacking</sup> ~~building~~  
up <sup>at</sup> ~~from~~ ~~the~~ nuclear power ~~industry~~ plants  
as used up fuel rods from <sup>core of the</sup> reactor ~~are~~.

Our <sup>thought they</sup> government wanted to <sup>bury</sup> ~~put~~ some of its defense  
waste ~~feet~~ <sup>tons</sup> below in deep ~~geologic~~  
salt beds near Carlsbad New Mexico.

~~Then~~ They were ~~going~~ calling the site a Waste  
Isolation Pilot Plant. (WIPP)

They began having second thoughts more recently



CW Hathaway

Todd Research & Dev Corp - Plhcan

X

[REDACTED]

X

[REDACTED]

going out of  
the big - 2/4  
made annmt  
only by honor  
contract commit  
— no new contracts

most up in Aug — 1/2 doz end  
up to end March — Betty, New  
burial site: 10% a month  
have to get solid waste  
disposal permit enuncions.  
May 81 municipal solid

some self-generated waste  
were  
only comm processors  
4 firms in state of TX  
which do brokerage work



1. potash, Carlsbad
  2. interviews, Carlsbad / <sup>anti</sup>women, <sup>PRO</sup>148 men, <sup>ANTI</sup>186 GUY, <sup>ANTI</sup>266 OLD MAN, <sup>women</sup>290 (sentit)
- 232

tribed women end

- 3 interviews Carlsbad / cover panel, audience interview
- 4 Interviews Carlsbad / Mayor, panel business pros / <sup>stare</sup>stare
5. Carlsbad cover, <sup>petition</sup> - had video of rest
6. Rasmussen - Lublock interview
- 7 Haxson series - mkg protest, Wilson, Porter



Types

3 largest states of radioactive users.



- Rad Reiner Bays

on transportation <sup>heavily</sup> <sub>or fear</sub>

- Burning Eco Geology - <sup>on transport</sup> govt admits not safe in part  
on salt - site eastern

Carlsbad folks on white wash, on not being radical or  
reactionary



Neutral

Hamilton - statement of problem

? Fisher / Wermund



shot of bomb

nuclear power - ~~a frightening~~  
~~almost magical thing~~ - the  
power behind the atom  
bomb, the element in the  
<sup>nuke</sup> reactor which creates  
energy but which might  
also supposedly melt  
down deep into the heart  
of the earth - the famed  
China syndrome - and  
a known cause of that  
mysterious disease - cancer.  
bite - bomb

Rep Hanna is right - no  
deaths have been pinned  
directly on nuke power plants -  
~~but does that mean~~  
~~it's an industry w/o problems~~  
but 3 mile island was  
a frightening experience  
- and the industry came  
under close scrutiny

one of the things the  
public discovered was  
nuclear waste



store toxic LLW from Houston & Dallas  
in Leon City

core holes in Randall city - Palo Duro  
~~Congo~~ Basin - salt formations

LLW defense - Pantex, Los Alamos, Sandia

Schmitt - state's rights

Short term above ground, no long  
term sol

Truck by truck & train thru Amarillo  
to WPP - Amarillo & Leggett

TENARC - to protect TX interests  
fed site eval process  
people have ~~not~~ been  
& policy expertise

Chem Nuclear - wants LLW

US Rep Alex Teague in Sept 77  
opposed Carter

Breeder Reactor - Amarillo - SB  
on hold indefinitely

Comanche Peak 80 miles from downtown  
Dallas - on site 65 per cent  
capacity through 89 - can be  
expanded

Waste disposal co's considering Permian Basin  
& Pinery waste at E. Tex





505 King Avenue  
Columbus, Ohio 43201  
Telephone (614) 424-6424  
Telex 24-5454

September 11, 1979

#### NATIONAL WASTE TERMINAL STORAGE PROGRAM INFORMATION MEETING

An information meeting covering the National Waste Terminal Storage Program will be held on October 30, 31, and November 1, 1979, at the Neil House Hotel, 41 South High Street, Columbus, Ohio to provide an exchange of technical information among program participants and those with a technical interest in nuclear waste management. The public is invited to attend.

The meeting, sponsored by the U.S. Department of Energy, is being organized by the Office of Nuclear Waste Isolation. ONWI, which is operated by Battelle Memorial Institute, has a major coordination role in the NWTs program.

A plenary session has been scheduled for October 30 to provide an overview of the NWTs program for both the technical community, particularly subcontractors, and the public. A no-host luncheon will feature a U.S. Department of Energy speaker. In the afternoon a panel discussion addressing the day's proceedings will provide an opportunity for review and clarification.

October 31 will feature three concurrent technical sessions focusing on science and technology, geological explorations, and process/equipment development programs being conducted by ONWI in support of the NWTs program.

November 1 will include three concurrent morning technical sessions on systems analysis, site and repository licensing, and facilities engineering programs. The afternoon general session will be devoted to a panel discussion of technical issues raised by attendees.

The agenda for the meeting is enclosed. If you are interested in attending this information meeting, please return the registration card on page 25 of the agenda with the October 30 luncheon charge if you plan to attend. Also enclosed is a hotel reservation card to be returned directly to the Neil House Hotel if you require hotel accommodations.

I would appreciate knowing of your intent to participate in this meeting by October 15 so that we can appropriately plan for the total number of participants. Your continued interest in this program is appreciated.

Sincerely,

A handwritten signature in black ink that reads "Neal E. Carter".

Neal E. Carter  
General Manager

NEC/LMM:vjd

Encs. (2)



Box  
Thompson all

new  
types  
specific

FIRST CLASS MAIL

material

(I sorted it out)



# HIGH PLAINS UNDERGROUND WATER CONSERVATION DISTRICT NO. 1

## ROUTING SHEET

From: \_\_\_\_\_ Date: \_\_\_\_\_

To Thru

- ☐ ☐ MANAGER
- ☐ ☒ ASSISTANT MANAGER  
Don
- ☐ ☒ TECHNICAL DIVISION  
Mac *CDM 4-22*
- ☐ ☒ Field Support Team  
Butch *B* Dan *D*
- ☐ ☐ Clerk-Typist  
Pennye
- ☐ ☒ PERMIT DIVISION  
Clifford *CEZ*
- ☐ ☒ Permit Support Team  
Obbie *OB*

To Thru

- ☐ ☒ AGRICULTURE DIVISION  
Ken *Ken* Dwight *ADA*
- ☐ ☐ SUPPORT DIVISION  
Tony Keith
- ☐ ☒ PUBLIC INFORMATION  
Patricia *PB*
- ☐ ☐ BOOKKEEPER  
Norma
- ☐ ☐ SECRETARIES  
Kathy Roxanne  
Ruby

Attachment For:

- ☐ Review
- ☐ Comment (Oral/Written)
- ☐ Necessary Action
- ☐ Prepare Response for  
\_\_\_\_\_  
Signature
- ☐ Approval
- ☒ Information
- ☐ Signature
- ☐ X-Section Mailing List

File With:

- ☐ / Your Files
- ☐ General Files
- ☒ Library
- ☐ Rotary
- ☐ Other (specify)  
\_\_\_\_\_



# Traces of radiation found in wells near TMI

HARRISBURG, Pa. (AP) — Traces of radiation, possibly from the leakage of severely contaminated water, have been found in test wells drilled around the base of Three Mile Island's damaged nuclear reactor containment building, officials at the power plant said yesterday.

Plant operators said they would not rule out the possibility that some of the severely contaminated water in the building has begun to leak out for the first time since the March 28, 1979, accident at the plant's Unit 2 reactor.

But a statement issued by the plant said the radioactivity was more likely from a large outside storage tank that holds mildly contaminated cooling water for TMI's undamaged and idle Unit 1 facility.

"Last week, water samples from three of eight wells had tritium levels about two to five times greater than normal background," said the statement.

"Although the activity for these two elements is above background levels, the concentration is about 10 per cent of the Environmental Protection Agency's drinking water guide-

lines," it said.

The statement said no unusual radiation has been found in the Susquehanna River downstream from the plant.

Plant officials were not immediately available for comment.

Frank Ingram, a spokesman for the Nuclear Regulatory Commission in Washington, said "I don't anybody really knows yet" where the radiation is coming from.

As to whether it was leaking from Unit 2, he said, "That's a possibility, but not a probability." He said leakage from the storage tank also was a

"possibility," but that more testing is needed.

Tritium is known to exist in both the water tank and in the 600,000 gallons of reactor cooling water trapped inside the huge reactor containment building.

The highly radioactive cooling water accumulated in the basement of the 200-foot-high building after it gushed through a stuck valve at the height of the crisis, the worst in the history of commercial nuclear power.

The 400,000-gallon Unit 1 tank, which has developed small temporary leaks in the past, is located near the

Unit 2 containment building.

Some officials had expressed concern in recent months that the walls of the containment building might eventually leak either the water or a less serious accumulation of krypton gas.

The steel-reinforced concrete walls are four feet thick and their interior has a layer of steel about a half-inch thick. Most concern about leakage focused on the possibility that water might cause the steel lining to corrode.

The concrete walls, without the lining, cannot be penetrated by radiation, and they would prevent the escape of radioactive gases. But they were not expected to stop the seepage of radioactive water.

The eight wells were drilled around the base of the containment building so that samples could be periodically taken just to be able to detect such seepage.

Local residents and government officials have opposed any releases of radioactive water into the Susquehanna River.

The city of Lancaster and other communities downstream obtain their drinking water from the river.

In recent weeks, however, attention has been focused on a proposal to vent a some radioactive krypton gas from the containment building into the atmosphere.

Plant officials have said they need to vent the gas to be able to enter the building and get on with cleanup operations, including the treatment of the radioactive water.

They say the venting of about 57,000 curies of krypton would involve no public health hazards. They also say there is many times that much radiation in the water.

No official decision has been made on the venting plan, pending public hearings and future impact studies.



Occult offers opportunity, says seminarian

## Failings of Christianity feed cults

There is a great deal of interest among Americans in the occult and the supernatural these days, but there are three basic reasons Americans leave Christian churches to follow other cults, sects and religions, according to a Louisiana Baptist seminarian.

One reason is a lack of worship depth in Christian congregations. A second is that "we talk the talk but we don't walk the walk" of Christianity. And a third is that there is a lack of a healthy family image for many in today's generations.

Dr. Thomas Starkes, Willson lecturer at West Texas State University this week, said, though, the occult and supernatural hold a certain fascination for all people these days for 17 reasons he's outlined in his books.

Three of the key reasons, he said, are these: everyone is superstitious; the mass media has given credibility to witches and other occult figures; and the philosophy

of the youth subculture has been in opposition to basic logic.

During lectures Monday, Starkes addressed several kinds of occult activities and the Eastern influence on American religious patterns.

Astrology, he said, is a big business in America, with Americans spending an average of \$1.40 per person each year on astrological items. He also covered Satanism, psychic phenomenon, UFO witnesses, witchcraft and other occult events and activities.

"I don't see these as a problem," he said, "but as an opportunity." He said the cults present themselves as opportunities for Christians to examine their own feelings about the supernatural, and to turn the occult to their own purposes.

The second reason he

doesn't worry about the occult, he said, is because he believes in God's powers.

During a noon soup and sandwich seminar, Starkes outlined just one of several sects from the East—the Unification Church of the Rev. Moon.

Moon is rich, Starkes said, with a worth of about one-third of a billion. He owns shipbuilding yards, shrimp industries and a variety of other businesses in this nation.

The typical Moonie is an 18-year-old who drops out of college because of the attentions paid him by Moonies, goes to New York to

undergo what Starkes referred to as "thought control" techniques at the Unification Church training center.

There, the potential Moonie is kept awake for 60 hours, during which time he cannot ask questions and during which he is harangued about Moonie beliefs.

What are Moon's beliefs? Starkes said Moon believes Satan impregnated Eve, who bore Cain and Abel and brought sin into the world.

Jesus came to the world primarily to be married and have perfect children to purify the human race. But

he failed.

Then, Moon believes that he, the Rev. Moon, is the third emissary from God to help purify the human race by having perfect children, Starkes said.

How should Christians respond to these sects?

Starkes suggests that Christians rediscover their own heritage as Christians, that they get information on other sects so they know what they are about, and that they learn some good models of witness.



# Free enterprise system discussed

By RONNIE McKEOWN  
UD Reporter

America's free enterprise system and its people's way of living in general are deteriorating from within the workings of the government, according to J. C. Lewis, member of the American Agriculture Movement and former lieutenant colonel in the U.S. Air Force.

Interlocking memberships by government officials and corporation heads in four major organizations are pushing the United States toward a world government, Lewis said Tuesday night in a speech sponsored by the Tech Agronomy Club. Lewis' speech focused mainly on two of these organizations, the Trilateral Commission and the Council on Foreign Relations.

"I'm a flag waver," Lewis said. "As far as my philosophies are concerned, I love the Lord, love my family and I love this country."

Lewis said the three institutions of the church, the family and the country are being destroyed by these influential members of the Trilateral Commission, Council on Foreign Relations (CFR), the Committee on Economic Development (CED) and the Aspen Institute on Humanistic Studies.

Lewis named several government officials, including presidential candidates Jimmy Carter, John Anderson and George Bush as serving or formerly serving on the Trilateral Commission. Lewis also named several of America's top corporations, including the major television stations and oil companies, which have corporate heads on the Trilateral Commission, the CFR, the CED or the Aspen Institute on Humanistic Studies. Lewis also noted that many of the organizations' members served on more than one of the commissions.

"Every president that's been elected since Franklin Delano Roosevelt—with the possible exception of Lyndon Johnson—has been a member on the Council on Foreign Relations," Lewis said.

"My son, born in this country, has an equal chance to be president if he wanted to," Lewis said. "But I can tell you one thing: if he hasn't been a member of the 1600 in the last 50 years, he doesn't have much of a chance, does he?"

Lewis also pointed out that 18 members of President Carter's present cabinet are members of the Trilateral Commission.

"If those 18 were all farmers, at least they'd be representing a couple—two to four—million people," Lewis said. "But that's not the way a government works. As it is, they (Trilateral members) represent 65 very special interest groups."

"I'd be against it if they were all farmers, and I happen to be a farmer," Lewis said. "I will not buy the assumption that the Trilateral Commission is the only source of qualified people."

The major objection Lewis presented against the organizations was its

support of a world government and push for Americans to transfer sovereignty from the United States to a world government.

"If that isn't giving up your sovereignty, I don't know what is," Lewis said. "I can't understand how a man can take an oath of allegiance to support the Constitution of the United States of America and be also in support of world government."

"I guarantee you, you won't find world government in the constitution," Lewis said. "If it wasn't in the constitution, let's inform the people and let them vote on it, but let's not slide it in the back door."

Lewis ended the speech with some answers to the problems he said he feels interlocking memberships in these organizations present. He said that the people should talk to their legislators and find out how they stand

on these issues. He added that the states should have the right to recall legislators, and that states should have more power overall.

Ron Miller, campus chairman for George Bush, said of the Lewis speech: "The conspiracy theory lacks the smoking guns. They have no documentation of their so-called facts."

"Three types of people place stock in the conspiracy theory: Those who stand to gain fame or notoriety; those uninformed, and thereby manipulated by so-called experts, and those so frightened by the current economic state of the country that they grasp for any explanation for the difficulties," Miller said.

"I compare the conspiracy theory to McCarthyism of the early '50s, the Populist movement of the late 19th century, and the Salem witch hunts," Miller said.

## NEWS BRIEFS

### Dorms' long distance service discontinued

On-campus students who will leave campus before the residence halls close will be able to arrange to easily discontinue their long-distance service.

According to Jim Goodwin, public relations manager for Southwestern Bell, representatives will be in Room 209 of the University Center 9 a.m. to 5 p.m. today through May 7, to help students.

Students who live off campus should take their phone to Room 110 of the Civic Center sometime between 8:30 a.m. and 4:30 p.m. Monday through May 9.

Goodwin said that off-campus students owning phones that cannot be unplugged should cut the part of the cord that is near the jack.

Because of the special workshops and other events that occur during the summer, the dorms' local phone service will not be discontinued, he said.

### Shoe polish can lead to tickets

Anyone driving a car with shoe polish on the windshields are likely to be ticketed, according to Bill Morgan, police information officer.

Morgan said there is a state law against driving with obscured windows, and that it constitutes a moving violation as well as a safety hazard.

Morgan said ticketing was a "move toward accident prevention," due to an increase of shoe polished-windshields in Lubbock this year. According to Morgan, most of the polishing "appears to be predominantly in and around high school neighborhoods," although he did say fraternities and sororities are also possible violators.

Morgan said that keeping windows clear, whether covered with ice or shoe polish, "is the responsibility of the driver of the vehicle."

### Registration packets available next week

Registration for the first term of the 1980 summer session at Tech is scheduled for 7:30 a.m. to 6 p.m. Monday, June 2, in the Municipal Coliseum.

Registration packets may be obtained in the University Center Coronado Room until Friday 1-6 p.m., according to Don Wickard, registrar.

Late registration will continue through Friday, June 6 from the registrar's office and departmental offices.

Classes start at 7:20 a.m. Tuesday, June 3.

### "Human Race" series continues Thursday

The second part of Doug Nurse's series addressing Francis Schaeffer and Dr. C. Everett Koop's film "Whatever Happened to the Human Race" will be printed Thursday.

## WEATHER

Today will be cooler with a high near 80 and a low in the mid 50's. There is a 20 percent chance for rain today.



Rogen Burnham  
WCKT-TV

April 9, 1980

Dear Rogen:

Much of the time I spent at KCST-TV in San Diego was working with the Stoner concept of the "Troubleshooter" who is basically a consumer reporter. I researched, and helped supervise a staff of college age interns who re



The present ~~problem in the Texas/New Mexico~~ situation in the Texas/New Mexico  
areahas the potential for many of the problems facing ~~the context of~~ other  
areas of the country, but there is still time for some public input.

At present there are

are any cracks--so hopeful there will be no radiation leakage  
to where man could eat, drink or breathe anything contaminated by  
radiation.





# League of Women Voters of Lubbock

Lubbock, Texas

July 29, 1980

Florence M. Chichester  
League of Women Voters Education Fund  
1730 M Street  
Washington, D.C. 20036

Dear Florence:

Thank you so much for sending me the two copies (one is the regular mailing) of the Nuclear Waste Primer. Tell Marjorie she did a superb job of writing and it is an excellent publication.

There is a bit to report on the status of the project, but not much. Patricia hired a local ex-newswoman to do scripting at an hourly rate (minimum wage) and while they did not agree on an unbiased point of view, apparently Cat was able to pull out several dozen quotes and place them into a videotape.

Cat plans to leave Lubbock at the end of August to live in San Diego, and the project will go on with the help of a local League assistant, Mrs. Halcyon Baggett, who works for a PR firm here. Halcyon is a former local President and has been on the state board for the League.

We both (Patricia and I) feel very encouraged that Halcyon has agreed to help. She is a professional and sees little difficulty in production and editing. We have tentatively decided to do a 30-minute show instead of the 60-minutes originally planned, but that is not definite.

We have high hopes of winding up the project within the next couple of months, and feel that the Nuclear Waste Primer will be invaluable to Halcyon as an information source, and to all of us as a guideline for the script.

There is a bit of money left, about \$500, Patricia estimates, which we will definitely need for production facilities. If we need anything additional, we can tell a little further down the line.

I hope this helps a bit to enlighten you on the progress of the project. I plan to send copies of this to Patricia, Laura Kever, Diana Clark, Isabel Miller, and Halcyon. If you have any questions, drop us a note.

Warmest regards,

Pat Nickell  
President, LWV-Lubbock



Boomb shot/ bomb image voice over

waste from nuclear power and defense weapons is growing  
at an incredible rate. (Stats)

*INSERT*  
states of  
The / Texas and New Mexico are being asked to take their share  
of nuclear debris---and some say more than their share.  
(Story about Pelican Island/Ca waste? Clements)

There is no argument that we'll have to put the  
radioactive trash the country has accumulated somewhere..  
even ~~deeply~~ *strongly* anti nuclear groups agree to that. BITE-Lynn  
But there are a number of questions ~~that~~ people can't  
seem to agree on

The biggest question is safety. ~~some/~~ Scientists claim they  
problem of storage of nuclear debris is not ~~that~~ big a  
deal: (Bites) But those who oppose nuclear power in general,  
and nuclear waste disposal in their vicinity say, first of  
all, they do not trust the scientists (Bite) and they blame  
their lack of trust on the government (Bites) Scientists  
say they are lost when they have to confront this type  
of emotional reasoning (Bite) and they point to all kinds  
of evidence supporting their stands (Bite weapons testing/good  
for environ)

But, as profound and deepfelt as ~~the~~ general discussions *of nuclear waste disposal*  
are---they come nowhere near matching the intensity of  
people who may be directly touched by the siting of a nuclear  
waste storage facility in their area.

population  
Such a ~~group~~ is located in Carlsbad, New Mexico. The  
Government has proposed siting a storage facility in the  
~~xxxx~~ underground salt deposits there. *They spent millions of dollars*  
say salt is an excellent medium for storing nuclear waste: *4 years of research there*  
~~xxxx the radioactive stuff can have deadly effects if~~



INSERT AFTER STATES

/A

and nuclear waste isn't just normal trash. It can be deadly to humans, if it gets into the biosphere--

air or water, in sufficient quantities. Nor is it a short term threat. The <sup>scientists</sup> most supportive of the value ~~and~~ <sup>of the</sup> nuclear option, admit that the problem will be around for at least 500 years (Bite-Cohen). The other difference between nuclear trash and the kind we dump every day at landfills, is that the radioactive debris is heat producing.

The very reaction which ~~allows~~ makes the elements in fuel rods energy producing---continues to work even after they no longer produce enough to be kept in place.

And whatever storage facility is chosen for nuclear debris must provide both long term safety and stable storage in ~~xxxxxxx~~ despite the high heat load of the garbage.



2

Salt deposits have existed for thousands of years in a fairly stable way. Water, which could bring the deadly radioactive elements out into the biosphere, is not usually present to any great degree near salt, otherwise the salt would have dissolved and surfaced. And ~~the~~ salt is also stable under heat. Even cracks and fissures that occur in salt deposits usually heal themselves so that radioactive reaction would not be creeping up through the earth.

Opponents of the site say that salt is not the ideal medium. They claim there are others better--others far away from Carlsbad, New Mexico. (Bite) experimental

The plan for a nuclear waste storage facility in called ~~XXXXX~~ WIPP, the Waste Isolation Pilot Plant, Carlsbad/has become a political football.

After spending \_\_\_\_\_ million/billion dollars on research in the area, President Carter recently vetoed the site, calling for further research. Congress then overrode his veto (Political steps?) and put the plan back into action.

Local opinion is highly emotional--with town fathers who see an economic advantage for the community supporting speaking profoundly in favor of the facility. what they feel is a safe and useful industry, (BITE)

while ~~But~~ those in opposition range from highly emotional appeals to economic arguments of their own. (BITE)

None are the people in New Mexico alone in opposition to a nuclear waste storage facility. It appears that no matter where a location is proposed--violent and emotional disagreements arise. BITE (Canyon facility--explain)

And the same disagreement and dichotomy of opinion exists on almost every facet of the nuclear industry.

~~If the government finally succeeds in getting a site chosen and into action--people complain that the~~



one objection raised by those who live nowhere near the proposed site is the issue of transportation. They not only do not want the site in the neighborhood, they don't want the debris anywhere in their vicinity. (Bite) this despite all of the arguments nuclear proponents can bring to bear. Bite



Perhaps, in the final analysis, the problem of nuclear debris comes down to trust. <sup>INSERT</sup> There is an enormous amount of radioactive waste being generated: in medicine, in energy production, and in defense. Even if we were to stop all of the uses of nuclear materials which generate waste ~~xxxxxxxxxx~~ tomorrow, we would still have the problem of what to do with the trash from today and the 40 years of nuclear experimentation and production which preceeded it. And if we claim state's rights to reject a facility anywhere near (Bite) and adopt the beliefs of those against nuclear power--(BITE) we still must dispose of a large amount of waste.

BITE: It'd a problem that's got to be solved;;; its a problem th t's not going to go away etc

INSERT: the belief that our scientists and those who govern us are still people who will not willingly choose ~~xxxxx~~to deliberately destroy those they serve BITES



2

Until recently, no one seems to have recognized the potential for harm in the ~~radiation~~ <sup>tailings</sup>. Bite: Foster (tailings 80% of radiation) Those radioactive tailings are governed by several laws, including the Uranium Mill Tailings Radiation Control Act of 1978. But at this point nothing much has been done. The first action is scheduled to be taken on abandoned tailings--~~and~~ <sup>but</sup> all but one ~~site~~ of the sites in Texas ~~are currently in production~~ <sup>is currently in production</sup>, and that one will probably go into action shortly. No steps have been taken towards requiring companies presently milling the ore to cover it---although sources say this may happen later on.

But the ~~problem of~~ mill tailings haven't ~~created~~ <sup>caused</sup> anywhere near the ~~controversy~~ <sup>controversy</sup> ~~from the~~ <sup>the</sup> storage of low level waste. ~~As~~ Todd Research Co (correct name?) was processing and storing low level waste on Pelican Island... until that facility became a center of public ~~controversy~~ <sup>furor</sup>. Governor Clements came out ~~opposing~~ <sup>in opposition to</sup> storage of ~~the~~ radioactive waste <sup>from CA</sup> there when he heard waste from California was being stored there. He also opposed storage of the radioactive material in an area subject to the possibility of intense storms--which he felt could damage or carry off many of the drum-like containers holding the 11-thousand pounds (check) in above ground areas. Partly because of the bad press generated on this subject, Todd research ~~has~~ decided to get out of the low level waste storage business, ~~the~~ <sup>A</sup> company <sup>spokesman</sup> says ~~it~~ <sup>will have shipped</sup> all the deadly debris ~~off~~ <sup>leaving</sup> to Beatty, Nevada for burial by about May of 1981... ~~leaving~~ <sup>only</sup> the small amounts of nuclear waste they themselves generate stored on Pelican Island.

~~Todd Research was the largest company handling low level waste in Texas~~ <sup>companies in TX handling low level waste</sup> but there are several others. Isotex and Nuclear Sources and Services are two of them. These and 5 other companies are storage brokers. They contract to pick up waste from hospitals and companies who use radioactive materials in their businesses---and dispose of it. Generally, that means storing it on an interim basis until it can be transported to one of the 3 (?) burial sites elsewhere: Hanford, Beatty and \_\_\_\_\_. ~~And even~~ these smaller operations have not gone unscathed by public opinion. When Nuclear Sources and Services, Inc. bought an abandoned rehabilitation center in Leon County a crowd of about 75 showed up to protest---and the largest



①  
"Toxic Tels"  
↓  
Fission  
annihilation  
dividing atoms  
explosion  
B.M.I  
accidents -

bite: song <sup>disposal</sup>  
The Nuclear <sup>waste</sup> ~~issue~~ <sup>has hit Texas</sup> <sup>DIVIDED</sup> ~~and many people aren't happy~~ <sup>are worried</sup>  
about it. In <sup>many</sup> ~~their~~ <sup>some</sup> minds <sup>radioactivity</sup> nuclear power stirs images of the atom bomb, the movie The China Syndrome which showed a nuclear power plant disaster which supposedly could end the world, <sup>the</sup> and fears of that mysterious disease: cancer. ~~People are worried about it~~ <sup>are</sup> about transportation accidents, radiation exposures and contamination of their air, this property, and their water.

2

Some <sup>of these</sup> people, like members of the <sup>Texas</sup> Mobilization for Survival and the Armadillo Alliance, have fought to keep nuclear <sup>waste</sup> plants out of Texas ~~1. just before it comes in~~ and sites for two nuclear power plants--Comanche Peak 80 miles from downtown Dallas, and the South Texas Project near Houston--have been occupied by protestors. In Austin there has been a referendum every year calling for a vote by the people to get out of the South Texas Project. Only once has it come close to passage. BITE

Comanche Peak is scheduled to go on line in 1981, and the South Texas Project in 1983-85 and People who ~~saw~~ <sup>saw</sup> the government reaction at 3 Mile Island are unwilling to have that scene duplicated in Texas or New Mexico. bite: Wilcox (government lies in 3 mile island) But while proponents recognize public fears, they maintain it's a safe source of power. Bite: Hanna (bomb image--but no accidents)

But it is not nuclear energy which may end up as the real question in Texas, <sup>it is</sup> ~~the~~ nuclear waste. ..and where to put it. Country wide the ~~the~~ radioactive debris is building up at an incredible rate. There's high level waste: highly radioactive liquids and spent fuel cores <sup>from reactors</sup>: 70 million gallons of the liquid and 5 thousand metric tons of used fuel elements---and there's also 66 million cubic feet of lower level waste--things like the work gloves and tools contaminated because they were used near a radioactive source---and there's 155 million tons of radioactive tailings left behind when the uranium has been extracted-- \_\_\_\_\_ of that in Texas and \_\_\_\_\_ in New Mexico.

Nuclear waste is the atomic trash heap that is left when nuclear radioactive materials are used

And we've got ~~some~~ all kinds in TX & NM



3  
town in the county has ~~xxx~~ a population of less than 1,300. (successful or not?)

There are also 3 sites in the Texas-New Mexico area for storage of low level defense wastes: Pantex near Canyon in the Panhandle, Sandia and Los Alamos in New Mexico. Little is really known about what goes on at these sites---as they fall under supervision by the military and no civilian entity, like the NRC, has jurisdiction. Nor do federal laws apply to them although the state has ~~just~~ asked the Radiation Control Agency or the Texas Department of Health to develop an emergency plan for the Pantex plan, just in case.

~~There is also the problem of high level waste.~~ <sup>is also stored in Tx & NM - defense waste</sup> Currently, plans are <sup>at present -</sup> for the nuclear reactors to store their spent fuel cores at the site. Comanche Peak has the ~~xxx~~ design capacity to hold the <sup>but with the opening of the nuclear reactors,</sup> used up elements to 1989--and the possibility for expansion. <sup>their fuel cores will be need to be disposed of.</sup>

With the build up in the use of nuclear materials in medicine, defense and power generation, the federal government has made an effort to decide what to do with the ~~waste that~~ <sup>on a long term basis.</sup> nuclear trash that invariably follows. Scientists have come up with two practical alternatives: reprocessing and deep underground storage.

President Carter opposed the concept of re-processing because that process creates plutonium as a by-product. Plutonium is an essential ingredient in atom bombs--and the President was afraid it would become too accessible to small countries or terrorist groups if the re-processing plants were allowed. So, in 1977 he banned re-processing. Bite: o'Leary (pres policy)

That left deep geologic storage. One of the mediums scientists have been researching as a storage base is salt. Salt has several plus factors, including the fact that the intense heat the waste would generate would not disturb it, and also that any cracks or fissures ~~that~~ <sup>which</sup> occurred would be self-healing. That would keep the radioactive material out of man's food, drink and air--which is the purpose of the storage.



4  
The federal government resolved to test out the theory of storage in salt...and ~~began looking for a site~~ <sup>their choice was</sup> ~~They chose a 60 acre~~ <sup>35 miles from the TX border</sup> area near Carlsbad, New Mexico, and began plans for WIPP--the Waste Isolation Pilot Project.

opinion on the installation ~~was~~ is divided

~~But they did not go unchallenged.~~ A group called organized to stop WIPP, and they spoke up at several public hearings--voicing their fears and the problems they anticipated:

BITEs:

Scientifically and emotionally.

~~At the same time, some scientists began to point up flaws in the~~  
~~don't like whole idea of salt~~  
~~use of the salt medium.~~ Proponents say it will safely contain the

radioactivity for the 5-600 years which will contain the most dangerous elements. Opponents point out flaws like brine pockets:

areas of mixed salt and water which might seep down to the storage casks and corrode the waste containers--allowing it to then leak

to the biosphere. Proponents say that testing is necessary BITE

but opponents say they don't want any testing until all the problems have been solved: BITE: <sup>and they get pretty emotional about it.</sup>

While everyone was arguing, the government decided to allow only defense waste to be stored at the site. That would take it out of the realm of public control--since defense waste, as at the Pantex, Los Alamos and Sandia sites, is regulated only by the military.

~~President Carter~~ The state of that site is in limbo right now.

But it points up one of the biggest questions in regards to nuclear waste: ~~who has the right to say where we dispose~~ does the state chosen for a disposal site have any right to veto it?

Originally, New Mexico was promised that it would be allowed to work with the federal government in the design and set up of the WIPP installation. That agreement--the right of concurrence--was later neglected.

That put the TX-NM area in the center of the nuclear disposal hotspot conflict with



5  
Some people feel the right of concurrence is not important. BITE  
others feel it is crucial BITE. Some, like the governor of Texas,  
say that what is important is being responsible for one's own waste--  
but not to the extent of becoming a dumping ground for other states  
on areas which reject radioactive ~~waste~~ debris

Scientifically, the issue of state's rights is very important.  
If a state is allowed to reject a disposal site, will anyone else  
accept it? And ~~not~~ if they do, will it have the same qualities and  
advantages of the first choice site? Bite Hamilton (looking for best site)

One of the most common fears is that a community will be forced to  
accept the dump for economic reasons. BITE

And that fear remains because scientists ~~have lost their~~ <sup>seem to have lost their</sup>  
~~credibility with the public--so that no matter how reassuring they~~  
~~are BITE: Rasmussen (no big deal). Bite: Gordon (nuke bombs--no biggie)~~

the public and the environmentalists come back in disbelief: Bite:  
roxanne. That may be because the public doesn't really trust the  
government on this: BITE even highly pro-nuclear scientists notice  
this: BITE (when gov moved by public concern, not health and safety  
reasons) BITE: Cochran: lies to public, institutions pressure

And there may some concrete reasons for careful <sup>consideration</sup>  
In Texas the Radiation Control Agency admits they are behind in  
response capability. In the event of a reactor accident or a substantial  
release of radioactivity--the department does not feel it could  
evacuate people, house them, provide medicine, as well as measure  
radiation and test the water and the air with any degree of expediency.  
The department lacks capability to do any of the tests in the field--  
all would have to be taken to Austin to be evaluated---and they  
don't even have the possibility for radio communication between  
headquarters and the <sup>inspectors</sup> ~~people~~ who would be on the spot.



Doomsday may be upon us. Everywhere, the sky is falling. We can no longer eat, drink, breathe, or even sleep in the relative safety we enjoyed a few years ago.

Why? Are we really in more danger than ever before? Or do we just know about danger more than ever before.

Our consciousness has been raised. We know we are in mortal danger from ~~w~~ everywhere. Instant communication by the media keeps us informed.

A problem which has existed for more than 30 years has recently come to the foreground as an example of a danger to mankind.

What are we going to do with our radioactive ~~x~~ nuclear wastes? We have been manufacturing them for many years, since the nuclear age began with such a bang in 1944.

Even if the country decided to stop manufacturing them--that is not the answer, because we already have them.

They certainly present no danger to us as long~~x~~ as they are contained. The question is can we safely contain them. ~~XXXXXXXXXX~~ Does the United States have the technology to effectively contain nuclear wastes for a thousand years or more?

Since we have dealt with wastes radioactive for nearly 40 years, what is wrong with our current methods.

Nuclear wastes exist in America. They come from two sources--the defense industry



and the energy industry. ~~xxxxxxx~~ about 90 per cent of the wastes which exist today came from the defense program for America. The other ten percent, which should catch up in volume within the next 30 years comes from nuclear power plants.

Radioactive wastes which have been caused ~~xxx~~ by the U. S. government are today sotred in tanks interim storage tanks in fabricating plants such as the one near Amarillo, Pantex.; at Richland, Washington; at Aiken, South Carolina; Rocky Flats, Colorado; Idaho Falls, Idaho; Los Alamos, New Mexico; Albuquerque; Livermore, California; Oak Ridge, Tennessee; and many places throughout the U.S.

Commercial spent fuel is stored in Beatty, Nevada; Maxey Flats, Kentucky; West Valley, New York; Hanford, Washington; Sheffield, Illinois; and Barnwell, South Carolina.

Most of the government waste is in the form of a highly radioactive sludge, and is stored in ~~xxx~~ steel tanks. Many of the steel tanks are double walled, and most are encased in a four-foot-thick cement shell. Those generated in the 1940s in Hanford, Washington, have escaped from the tank in some instances. A leak at hanford caused approximately 500,000 gallons of highly toxic waste to leak into the ground there. The wastes stopped short of the underground aquifer there, and caused no known fatalities.

By 1957, the U.S. government was aware that it had to deal with radioactive wastes on a permanent basis and suggested permanent repositoryies for them, or deep geologic burial.



## Preliminary Script Development

### I Establish reality of Radioactivity

#### Pervasive

Cosmic bombardment (background levels)

Safe to dangerous

#### Beneficial effects

essential for life

used as tool - research, medical

#### Summary:

radiation represents life and power. It is something we live with  
and cannot live without -- OR CAN WE

### II OR CAN WE

Anti Nuclear demonstrations

Nuclear energy has generated a lot more than power:

Plant 30 years

waste: defense, commercial

international waste

nuclear power stall (moratorium on plant construction,  
licensing,  
reprocessing  
escalation/cost overruns

legislation stepping stones/stumbling blocks

mill tailings FED

domain STATES

accidents (WASTE)

Hanford, Rocky Flats, Silkwood, Cancer-rates

Public fears (hiroshima, health effects, destruction or degradation of  
biosphere, land values, genetics, terrorism, transport

Health

Safety

Political Credibility

Costs

research/development -- technical and social  
storage

NO--permanent disposal so far

interim means - steel tanks

WIPP

waste forms --glass, ceramic, calcine, clay, obsidian, tektite

waste hosts --salt, basalt, granite, tuff, shale, outer space, deep ocean,  
sun

retrievability

reprocessing

incineration

containers (super tiger)

transportation

social: public acceptance polls



III SHOULD WE TRY to live without it  
The critics power solution  
question of funding priorities  
other energy options

effects of phasing our nuclear energy --  
how: to live without it  
how: to live with it

why: as interim solution  
may be no other power available in time  
defense "you will always have with you"

WIPP  
LOFT

public hearings.  
Carlsbad mayor/site  
anti- demonstrations

INCOMPLETE



3 Prongs: Political/Legislative, Social/Fears, Technology  
areas to be covered in each segment

Technology:

Generation of Wastes

Uranium,  
mill tailings  
yellow cake  
fabrication  
fuel rods (LOFT?)  
transuranics  
fissiles  
reprocessing

Hot Garbage

spent fuel rods  
high level waste  
low level waste

Transportation AFS

Storage/Disposal

Isolation

criteria (site)  
multiple barriers  
packaging forms (durability long range)  
waste forms  
host forms  
burial  
stability  
aridity  
retrievability  
feasibility

Politics:

Policy development

IRG  
Public Hearings  
government agencies  
government credibility

Legislation

Fed vs State rights

veto site  
concurrence transportation

Incentives

Liabilities

Defense immunity

International ramifications

defense  
energy  
proliferation

Natural resource value

ECONOMIC FEASIBILITY

Public Fears:

ACTS of God

explosions

Plant meltdowns (LOFT)  
(china syndrome)

transportation  
accidents

damage biosphere  
permanent  
anti-nuke groups

HEALTH

genetic damage ✓

Cancer (illness) ✓

Financial losses  
property values

Terrorism  
proliferation ✓

media  
coverage

hysteria →

one of plant accident  
LOCA



# TEXAS:

Health Hazards

- 1 - Transportation
  - 2 - WIPP
  - 3 - Salt
  - 4 - Ground water
  - 5 - Mill Tailings
  - 6 - LLW Storage
  - 7 - States Rights - Legislators
  - 8 - <sup>power</sup> plants? - storage (Industry)
  - 7 - Legislators - de commissioning?
  - 9 - <sup>defense waste storage</sup>
  - 10 - 3a Sordis - " " "
- Radiation Board  
Bureau of Geology  
3. V.P. Rostin  
Small Nuclear Reactor

## Outside:

- Representing  
APC Storage

Policy - Protest  
ORG

- 9 - Referendum (Austin)
- Protestors / Speakers
- 8 Advisory Committees
- Citizens vs Business

Pelican Island



- need
- Clements on Waste
  - <sup>Tex</sup> & Utility company  
on building concrete peaks  
on Glen Rose

Our story isn't another broad rehash  
of N.W. - who, what, when, where, why - ad nauseum.  
It's TEXAS (Karnegie) Folks dealing with the  
questions of accepting or not accepting it.  
— Do we have that option?  
ever

That will look good, fill 30 minutes  
and be less subject to criticism about  
balance?

What do you think?  
call me tomorrow?

762-0181

Pat



Cat

I had more regret,

I have a solution — I think —  
to a hidden problem that has been  
bothering me. Scope is too broad  
for Texas grant. So...

I'd like to try this —

Consider Texas; make it strictly  
honor interest, get in whatever facts  
relate to TEXAS issues primarily —

(That means very little on "technology"  
or even health/safety per se but  
as it comes up as citizens' concerns.  
(Austin group is "concerned")

Will then be more of a "Nuclear  
Texas" documentary; & follow what we shot. (# Hanner)

12. Protests  
hearings  
~~protesters~~ <sup>bureau</sup> cuts  
researchers  
sites  
legislators  
citizen committees  
referendum Austin

- What have we got to worry about?  
Where, how much, what's the problem,  
who's doing what about it —  
Why ~~should~~ are people in Texas  
concerned — how much, where, etc...

over



As I mull it over - it better  
accommodates our video, minimizes  
the hassle over balance in my  
mind. Narrow the interviewees  
some & Get away from the  
credibility demand [means we would  
maybe use Cochran & East & Cohen more  
sparingly.]

Won't have to be a big education  
lesson on waste anymore. We can't  
really do it anyway.

So your inspired text still is valid  
but will narrow your frame of reference always  
to Texas, to keep it "local".



Damp Nuclear Texas?

how  
does not one

The lone star state ~~has no operating~~ nuclear  
power plants in operation.



## ONWI Checklist

Dear User:

We want to provide you with the reports on Nuclear Waste Isolation that are of interest to you. Will you check (✓) any categories below so that we can add your name to the appropriate mailing lists for distribution of new reports?

Return to: ONWI Library  
505 King Avenue  
Columbus, Ohio 43201

### General

- ☐ ONWI Report List
- ☐ How to Find Information on Nuclear Waste Isolation
- ☐ General Speeches & Articles
- ☐ Quarterly Technical Progress Reports
- ☐ Technical Newsletter
- ☐ Program Plan Documents

### Science and Technology

- ☐ Earth Sciences
- ☐ Rock Characteristics
- ☐ Waste Characteristics
- ☐ Waste-Rock Interactions
- ☐ Test Facility Definition
- ☐ Safety Assessment
- ☐ Data Management
- ☐ In-Situ Test Data

### Site Recommendation

- ☐ Site Selection Criteria
- ☐ Identify Candidate Geologic Systems
- ☐ Exploration/Survey of Candidate Geologic Systems
- ☐ Environmental Studies

### Process/Equipment Development

- ☐ Mining
- ☐ Encapsulation
- ☐ Repository Sealing
- ☐ Monitoring & Test Equipment
- ☐ Materials Handling
- ☐ Security & Safeguards Components
- ☐ Occupational Safety

### Systems Analysis

- ☐ Issue Analysis
- ☐ Transportation Systems
- ☐ Security & Safeguards Systems
- ☐ Criteria/Standards
- ☐ Alternate Concepts
- ☐ System Risk Assessment
- ☐ Socioeconomic Analysis
- ☐ Program Planning & Control

### Facilities Engineering

- ☐ Repository Engineering (Pre-title 1)
- ☐ Test Facilities

### Site and Repository Licensing

- ☐ Construction Permits
- ☐ Operating License
- ☐ Special Response



A NOTE FROM

*Frank B. Shants*

December 27, 1979

Pat,

Marge Wasson sent along the attached testimony for you.

I hope you had a good Christmas and best wishes for the New Year!

Regards,

**FRANK SHANTS**



mentation he said, "Some of the problems of leadership, at least as seen from the outside, should be resolved."

As for Carter's other recommendations such as creation of a five-member oversight panel to monitor safety, the commissioners declined substantive comment until they obtain more information.

In a more personal vein, Hendrie said he will easily accommodate himself to a commissioner's role; Kennedy "would have given it strong consideration" if he was asked to serve another term; and Bradford and Gilinsky maintained the intention to serve their full terms. — *Rob Laufer*

## CONFEREES AUTHORIZE WIPP FOR \$36-MILLION; NEW MEXICO DENIED CONCURRENCE

House and Senate conferees have authorized \$36-million for the Waste Isolation Pilot Plant (Wipp) as a DOE defense project. The bill includes most of the provisions of an amendment introduced by Melvin Price (D-Ill.) which provided that DOE would consult and cooperate (but not concur) with the state where the high-level waste repository is to be located (NW, 22 Nov. 2). The bill will now be voted on by both the House and Senate. It is not expected to encounter opposition, according to a congressional source.

The bill provides that a written agreement between DOE and New Mexico is to be negotiated no later than Sept. 30, 1980, the source notes. New Mexico has the right to comment and make recommendations with regard to the health and safety aspects of the Wipp project at key times. And procedures are established for DOE to consider, resolve and act upon these comments and recommendations.

However, in a separate report, the conferees note that the state does not have the right to veto the project. Furthermore, the conferees state that the DOE safety review is adequate and there is no need for overview by another federal agency. The state had wanted an independent review of the project on the federal level by an agency such as NRC, the source says.

DOE is planning on sinking an exploratory shaft at the site in July 1980, according to a source in the DOE offices in New Mexico. "We expect to be watching the rooms for about 10 to 20 years to see how they will conform to the optimal designs and how they become deformed to the optimal designs and how they become deformed from the pressure of the ground," the source says. In July 1981, a series of heater experiments will be held. Between now and the date the first shaft goes down, DOE is working on overcoming institutional problems. "While most of the local Carlsbad residents are in favor of the Wipp project, there is active opposition from Albuquerque and other areas," the source notes.

## BRITAIN SAYS 'YES' TO THE WESTINGHOUSE PWR; INDUSTRY CHANGES OUTLINED

British government approval of Westinghouse as licensor for Britain's first PWR was announced by Secretary of State for Energy David Howell as he outlined the nation's future nuclear power program in the House of Commons on Tuesday (Dec. 18). Said Howell, "With the approval of the government, the CEGB (Central Electricity Generating Board) have endorsed the National Nuclear Corporation's selection of Westinghouse as licensor for the PWR, and will shortly issue a letter of intent to NNC to authorize the design and, subject to the necessary approvals, manufacture of a PWR."

Construction of the PWR is contingent on final British safety clearance and a public inquiry, but Howell plans that it should be the next British reactor to be ordered and hopes that construction will start in 1982. Following Howell's statement, CEGB said it would issue the letter of intent allowing the NNC to adopt the Westinghouse design "in the new year." It names Sizewell on Britain's east coast as the "most likely" site for the PWR.

As expected (NW, 13 Dec. 6), Howell gave the government's backing to a nuclear program comprising around one station a year over the 10 years beginning 1982, or about 15 Gw total. "The precise level of future ordering will depend upon the development of electricity demand and the performance of the industry, but we consider this a reasonable prospect against which the nuclear and power plant industries can plan," he said. At a press conference later, Howell described the program as a "realistic and prudent nuclear program" for the 1980s and as "a sound basis" for the revival of the British nuclear industry. This was later echoed by Nuclear Power Co. chairman and managing director Norman Franklin. "I think [the program] is very satisfactory. It is a good place from which to begin," he said. The 15 Gw is on top of two 1,320-Mw advanced gas-cooled reactor stations approved by the last British government and on which work is just starting.

Howell did not say what kind of reactor the government wanted to build after the first PWR. Decisions about the choice of reactor for later orders will be taken in due course," he said. But CEGB indicated that both PWRs and AGRs might be built. "It is premature to choose between them and it is not inconceivable that there will be a place for both for many years ahead," it said.

Howell also announced changes in NNC's organization and role designed to make it into "a strong and independent design and construction company, fully able to supply nuclear power stations at home and abroad efficiently." The NNC and its operating subsidiary, the Nuclear Power Co., are to be compressed into a single company, which will be known as the NNC, and the General Electric Co. Ltd.'s supervisory manage-



**THE DOE-NRC CONFLICT OVER HIGH-LEVEL WASTE DISPOSAL ERUPTED AGAIN** Tuesday (Dec. 11) at a Senate nuclear regulation subcommittee hearing on an amendment by Sen. Gary Hart (D-Colo.) which sets Jan. 1, 1985, as the date for completion of a firm plan for waste disposal. Sheldon Meyers, director of DOE's nuclear waste management office, told the subcommittee that until NRC proposed a rulemaking requiring test shafts sunk on alternative candidate waste repository sites, DOE would have been able to apply for licensing by 1982. "Now it will be 1986 before we can begin construction," Meyers said.

NRC's William Dircks, director of the office of nuclear materials safety & safeguards, indicated that NRC is more rigorous in its requirements for waste disposal sites than DOE. "We have to force the licensee to demonstrate their method is adequate," Dircks said, adding that the NRC plan for alternative site testing, with shafts required, is supported by the National Academy of Sciences.

The two agencies disagreed also on the question of NRC's authority being extended to review of DOE plans for defense waste disposal, as proposed in the Hart amendment to a nuclear waste management bill in the Senate Environment & Public Works Committee.

**SEN. JAMES MCCLURE GAVE STRONG BUT QUALIFIED SUPPORT TO THE U.S.-IAEA** proposed safeguards treaty in testimony before the Senate Foreign Relations Committee Tuesday (Dec. 11), calling it an important element in "the international legal regime evolving under the Nuclear Nonproliferation Treaty." The Idaho Democrat said the pact should not be approved by the Senate, however, until legislation providing for domestic implementation of the treaty has been enacted. Such legislation is needed, McClure said, to clear up the legal basis of the Administration's and NRC's relations with IAEA under the treaty, the criteria for excluding facilities from safeguards, and the importance of protecting commercial technology and proprietary information.

Under the Administration's proposed scheme, facilities to be covered would be selected by an interagency steering group and NRC would apply IAEA safeguards through regulation of its licensees in most cases. That's "hardly the legal basis for determining the rights and obligations" of all parties involved, McClure said. A major dispute arising from that "abject lack of legal certainty" which could involve a licensee, NRC, the State Department and IAEA and with no "legal basis for resolution . . . would embarrass the U.S. and be extremely counter-productive to nonproliferation policy," he said.

Criteria for deciding to exclude facilities are of "serious concern," McClure continued. The Administration refuses to be pinned down on what those criteria might be, he said, adding that "it is quite clear to me that there has been an internal Administration debate on these issues, and just as clear that the interagency steering group is not the appropriate arbiter. Congress should and must establish the criteria" and perhaps even approve individual facilities for safeguarding.

Other details of the Administration's approach to implementation don't adequately protect the private sector, McClure added. "The Administration continues to refuse to guarantee that IAEA inspectors will be escorted" and NRC and the State Department "continue to undervalue the importance to this country of commercially sensitive technology and proprietary information." Predictable operation of nuclear power plants shouldn't be inhibited by "apparently arbitrary" safeguards requirements, he said, and "facility operators should be given a participatory right in the negotiation of facility attachments, but that right continues to receive Administration objection."

Chairing the session, Sen. Claiborne Pell (D-R.I.) said the committee would give McClure's recommendation "serious consideration," but asked if the problem might not be solved by simply revising NRC's regulations. McClure said that not only should criteria be defined more precisely, but that also there should be "clear statutory authority" as to who does what in implementing the treaty.

**A MAJOR WASTE MANAGEMENT BILL CLEARED THE SENATE ENERGY & NATURAL RESOURCES** Committee by a 13-3 vote Monday (Dec. 10) with provisions calling for establishment of away-from-reactor spent fuel storage, development of a plan for long-term storage of high-level waste and concerted federal attention on low-level waste disposal. The bill now moves to the Senate floor where some observers believe it has good chances for passage, adding, however, that the fate in the House is much less certain.

The committee shifted priorities since the bill was offered last February by Sen. Bennett Johnston (D-La.) from a strong U.S. commitment to away-from-reactor storage based on a federal program of receiving, transporting and storing spent fuel to one which will rely more on utility-provided on-site storage. The version offered by Johnston for committee mark-up last week would have directed the energy secretary to enter into contracts with utilities to take title to spent fuel, transport it to a storage facility, store it, and, ultimately, dispose of the waste. The government was to make AFR facilities available in a timely manner. However, as the bill emerged from committee, it sets first priority for on-site storage, while providing for parallel development of an AFR. To qualify for government contracts to take possession of spent fuel for interim storage, utilities would have to meet DOE-set criteria which are to reflect a national policy of on-site storage where feasible.

While on-site storage receives a higher priority, the committee did not adopt language proposed by Sen.



Bill Bradley (D-N.J.) which would have required a finding by the secretary of energy that on-site storage is not feasible before fuel could be acquired by the government.

The bill, as reported, limits U.S. AFR capacity to no more than 5,000 metric tons. There are about 1,750 metric tons of capacity at Barnwell, S.C., and another 400 tons of capacity at Morris, Ill., at two reprocessing facilities. So, Washington observers believe that more than one AFR site will be used, and expansion at Barnwell, while a possibility, would have to win favor with South Carolina political leaders. For now, the state's governor, Richard Riley, says he doesn't favor expanding the spent fuel pool at Barnwell.

The bill's movement through the Senate is but one of several activities pending on AFRs. DOE is to deliver a siting report to Congress soon, five public hearings on AFRs are planned, negotiations are to be held between DOE and owners of facilities with fuel capacity (although those haven't begun), and a report is to be issued by DOE on its AFR program and AFR costs.

The bill's high-level waste storage provision calls for DOE to propose a long-term plan, within one year of passage of the law, to accommodate both spent fuel and high-level waste resulting from commercial operations. Little else is specified other than that the proposed method allow for continuous monitoring and retrievability, suggesting a return in the minds of some observers to the Retrievable Surface Storage Facility concept scrapped about five years ago.

DOE has a long-term storage test program under way in Nevada, with spent fuel emplaced in casks both in shallow holes and concrete monoliths. One DOE source said the bill "represents a giving up on terminal storage, something I don't think we should do." During mark-up last week, however, a committee staff member characterized Administration efforts toward terminal storage as "a shell game" in which options were repeatedly developed, but never a firm proposal.

Before voting to report the bill favorably to the floor, the committee agreed to a "technical amendment" by Sen. James McClure (R-Id.) to speed a DOE plan for low-level waste. Instead of one year, DOE would have only 120 days after enactment to submit a plan which "defines" current and future requirements for low-level waste disposal capacity, and any need for remedial action at existing sites; evaluates and defines transportation needs, by regions; evaluates DOE's ability to own and operate low-level waste facilities for "interim" storage of commercial wastes; estimates the costs of all that; and provides for additional research and development as needed.

Two significant amendments to the bill were withheld but may, in one case, and will, in the other, be introduced on the floor as committee-sponsored amendments. The certain one was proposed by Sen. Pete Domenici (R-N.M.) who wanted some sort of veto power extended to states, but the problem was too great to resolve during the committee's mark-up of the bill. Johnston (D-La.) suggested they try to work it out and propose an amendment on the floor. The problem is to tie the veto to some standard(s) to avoid its arbitrary exercise. Meanwhile, Sen. Howard Metzenbaum (D-Ohio) may or may not get committee backing on an effort to pin down disposal fees in advance. His amendment would have required DOE to collect charges proportional to each utility's use of any AFR before making any capital expenditures. That being difficult at best, observers gave it little chance of emerging as a committee amendment, but some acceptable variation may be found.

One Senate staff source wondered where the Administration was during debate on this bill, saying its participation was desultory at best. One suggestion was that Administration officials are hamstrung on waste issues by failure of the President to decide what to make of the report of the Interagency Review Group on waste management, and reluctance to go beyond the IRG's recommendations. The bill reported by the committee appeared to go in a different direction than the IRG, that staff source noted; IRG "assumed permanent geologic storage, which the committee downplayed."

**FOUR PACIFIC NORTHWEST UTILITIES HAVE BEGUN A SERIES OF GEOLOGIC TESTS** at Hanford — the strongest hint yet that they might relocate four planned nuclear power units at the DOE installation.

Three of the utilities, Puget Sound Power & Light, Portland General Electric, and Pacific Power & Light, have been stymied in their efforts to build nuclear power plants elsewhere in the Northwest. The fourth, Washington Water Power, is not planning any nuclear plants but is seeking sites for new coal-fired plants.

Puget Power was seeking to build a twin-unit nuclear station in northwestern Washington (NW, 15 Nov, 6), but a rezoning granted the company five years ago by the Skagit County Commission is scheduled to expire this Dec. 31 and there is a question now that the commission would grant an extension.

The other two utilities with nuclear plants on the drawing boards have had similar difficulties siting power plants at Pebble Springs in northeastern Oregon (NW, 28 June, 14). There is a precedent for siting civilian nuclear power plants at Hanford because of the three nuclear units being built there by Washington Public Power Supply System.

The drilling crews are concentrating on an area six miles north of the WPPSS plants. Work is being done jointly to save money and speed the siting process, notes a source.



COMMITTEE ON SCIENCE AND TECHNOLOGY  
U.S. HOUSE OF REPRESENTATIVES  
WASHINGTON, D.C. 20315

SUBCOMMITTEE ON ENERGY RESEARCH AND PRODUCTION  
Hearing on Low-Level Nuclear Waste Burial Grounds

November 7, 1979

9:00 a.m. - Room 2318 Rayburn HOB

WITNESS LIST

The Honorable Dixy Lee Ray  
Governor  
State of Washington

The Honorable Richard W. Riley  
Governor  
State of South Carolina

The Honorable Butler Derrick (D-S.C.)  
U. S. House of Representatives

Medical Panel

Lawrence R. Muroff, M.D.  
President, American College of Nuclear Physicians  
and  
Director, Nuclear Medicine  
University Community Hospital  
Tampa, Florida

Leonard M. Freeman, M.D.  
President, Society of Nuclear Medicine  
and  
Co-Director, Division of Nuclear Medicine  
Albert Einstein College of Nuclear Medicine  
Bronx, New York

Dr. Rosalyn Yalow  
Nobel Laureate, 1977  
Senior Medical Investigator  
Veterans Administration  
V.A. Medical Center  
Bronx, New York

Dr. Joseph M. Hendrie  
Chairman  
U. S. Nuclear Regulatory Commission

Dr. Worthington Bateman  
Deputy Under Secretary  
U. S. Department of Energy



STATEMENT OF DR. ROSALYN S. YALOW

November 7, 1979

Mr. Chairman and Members of this Committee,

In my commentary during the Curie series shown on the Public Broadcasting System I decried the failure of Mme Curie to accept that there was an association between radiation from radioactive materials and injury to health and even death. It was a serious error by a talented scientist since, by the time of her death almost a half-century ago, there was already a considerable body of evidence concerning the real dangers of radiation. Since that time, particularly because of the development of the atom bomb and nuclear power, we have gained an enormous body of hard data on the potential for radiation damage and injury and the levels of radiation exposure required to be detectably injurious. It is an equally serious error at this time for scientists, in particular, and politicians and people, in general, to behave as if the dangers from radiation are unknown and incalculable. We must make distinctions among bombs and fall-out, nuclear reactors and disposal of their wastes and the safe handling and waste problems associated with the medical uses of radioisotopes. It is only the last which I will consider today. The differences among these are not "orders of magnitude" which simply means factors of ten but factors of millions, billions, and billions of billions. The "problem" of radioactive waste disposal from hospitals and medical centers is not a problem; it is a figment of the Regulatory Agency's small minds and fertile imaginations.



Let us consider some facts. Exposure to external radiation in the Denver-Boulder region is twice that in New York, twice that even in the environs of the Three Mile Island reactor at the time of the accident. This is because of Denver's elevation (and the resultant increase in cosmic radiation) and the natural radioactivity in its surrounding soil. The Governor of Colorado has not called for mass evacuation of the population or even of pregnant women and children — and with good cause. In spite of exposure of millions of people in that region to a doubled level of external radiation there is no evidence of increases in cancer rates, abnormal births or other deleterious effects. In fact most Americans would consider this region a very desirable place to live. In a 10 year period the Boulder population has increased 77% compared to only a 1% increase in New York. There are regions of the world in which exposure to natural radiation is up to 50 fold greater than in Denver. Even in these regions there is no firm evidence of harmful effects of the increased radiation exposure.

Let us consider another fact. As an adult, living, human being my body contains natural radioactivity;  $0.1 \mu\text{C K}^{40}$  and  $0.1 \mu\text{Ci C}^{14}$  are the predominant radioisotopes. According to the current rules of the Nuclear Regulatory Commission (NRC), if I were a laboratory animal who had received this amount of radioactivity as "by-product material" and died with this radioactivity still in my body, I could not be buried, burned or disposed of in the garbage. My carcass would have to be packed into a small can, inside a larger can and transported to a site for disposal of radioactive wastes. There I would needlessly occupy forever space that should be saved for significantly radioactive materials.



Another calculation -- my VA Hospital with 750 beds disposes of 12,850 lbs of garbage/day -- 4,680,000 lbs/year. The  $C^{14}$  content of our garbage is about the same as all the  $C^{14}$  waste material accumulating as a by-product of medical research in this institution -- with a cadre of very distinguished investigators. In fact if our research  $C^{14}$  waste were diluted in the neighborhood garbage it would not even be measurable. But our hospital is filled with yellow barrels with "radioactive material" warning labels which cannot be disposed of since companies are not making pick-ups. The cost of such unnecessary removal is sky-rocketing so fast that it will soon represent a major fraction of the research budget.

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- I do not believe the answer to our problems with so-called radioactive wastes is opening more sites. The Department of Transportation in its code of Federal Regulations, Title 49, Subsection 173,389 (5e) states quite realistically that "Materials in which the estimated specific activity is not greater than 0.002  $\mu\text{Ci/g}$  of material and in which the radioactivity is essentially uniformly distributed, are not considered to be radioactive materials." This is a sensible rule with which my hospital could live. There is no doubt that a rational, objective group of scientists and representatives of the lay public could develop a set of rules and regulations permitting the medical uses of radioisotopes to function in the service of man without creating objectionable hazards -- and without wasting burial sites as storage depots for materials of such low activity as not really to be considered radioactive.

There is no scientific reason to believe that radioactive hospital wastes are potentially harmful. However it is easy to demonstrate the enormous contribution of the use of radioisotopes to the prevention,



treatment and understanding of disease. Rather than cite other applications in Nuclear Medicine I will tell you about but a few examples from my own area of expertise -- radioimmunoassay. Transfusion hepatitis was a dreaded complication after surgery a decade ago. At present in our country virtually all bank blood is tested by radioimmunoassay, contamination of blood with the primary virus responsible for this disease is thus identifiable. This cause for post-operative morbidity and even mortality has been virtually eliminated. Ten years ago under-activity of the thyroid of the new-born was not detectable clinically until too late for treatment -- and thousands of children were doomed to unnecessary mental retardation. Now State and Regional Laboratories in many parts of the country are testing a drop of blood from a heel-prick of the new-born and, with the use of radioimmunoassay, identifying those with the disease. We are now able to treat in time and assure that these children have brain development equal to that of their siblings. What a bonus to these children, their families and society! Radioimmunoassay is now used in thousands of hospital and clinical laboratories to measure hundreds of substances of biologic interest -- and these measurements have had an immediate role in clinical diagnosis and pay off in the future in our better understanding of disease processes. No radioactivity is injected into patients -- and the amount of radioactivity in the test tubes used for the assay is not considered a radioactive material according to the DOT. Yet we continue to pile up yellow cans with magenta labels because of conflicting rules.

The public is frightened by the association of radiation and cancer. They need to be reminded that between 1930 and 1975 age-adjusted death rates for cancer excluding that for lung decreased by one-third in women and



slightly even in men while that for lung cancer increased 8 fold in women and more than 20 fold in men. Perhaps they need to be reminded also that  $Pb^{210}$  and  $Po^{210}$  have been observed in tobacco, in cigarette smoke and in the lungs of smokers. It is not without interest that it has been estimated that portions of the bronchial epithelium of smokers may absorb a radiation dose greater than the maximum permitted to the bodies of radiation workers.

Yet we continue to subsidize tobacco farmers -- and the yellow cans pile up.

*File  
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under*

No one can state with certainty that there is "no risk" -- all we can say is that deleterious effects of hospital radioactive wastes would be unmeasurable. The benefits are real and measurable. The greatest risk is no risk. It would be most unfortunate if laws, regulations and public policies for our country were determined by the fictions, fantasies and philosophies of the Fondas. It is time for cool heads and the wisdom of proven facts to determine policy.



A NOTE FROM

Frank B. Shants

1/7/80

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RECENT TINES VERAID . .

REGARDS,

Frank



DALLAS TIMES HERALD, Tuesday, January 1, 1980

# New Mexico N-waste dump site approved

WASHINGTON (UPI) — President Carter Monday signed — without endorsing — a bill authorizing construction near Carlsbad, N.M., of the nation's first permanent repository for highly radioactive defense wastes.

In a statement issued at the White House, Carter said despite his signature on the act, "I am not endorsing this approach" to nuclear waste disposal.

Although \$87 million is already be-

ing spent on the project, Carter has reportedly decided to scrap it in favor of a more cautious nuclear waste disposal approach recommended in a study done by a group of federal agencies.

The agencies, with the Energy Department the lone dissenter, seek evaluation and selection of several potential repository sites for both commercial and defense atomic wastes before any work is begun.

Under Carter's as-yet-unannounced decision, the Carlsbad site would reportedly become just one of several locations under study. The site is in the southeast corner of New Mexico, about 35 miles from the Texas border.

The department, which often acts for the Pentagon on nuclear matters, and the House Armed Services Committee favored building of the Carlsbad repository for defense wastes only.

"As evidenced by the efforts of the interagency review group on nuclear waste management, which I established in March 1978, my administration is committed to the safe management of nuclear wastes, and I believe that the future of (waste disposal) ought to be resolved only in the context of an overall nuclear waste man-

See WASTES on Page 11

## Carter seeks better N-waste plan



Nuclear waste site outside Carlsbad

### WASTES — From Page One

agement policy," Carter's statement said.

He promised "a comprehensive statement on the management of nuclear wastes in the near future."

A House committee source, on hearing reports Carter planned to shelve the Carlsbad project, said last Friday Congress could force construction of the project by invoking a law it enacted to combat presidential impoundment of funds.

The bill signed by Carter authorized \$138 million for fusion research, \$278 million for naval reactors, \$1.7 billion for atomic weapons development and \$291 million for defense waste management.

Only \$36 million of the waste management money was earmarked spe-

cifically for Carlsbad, although the pilot project became the hottest issue in the bill during deliberations on compromise language.

The proposed disposal site has long been a controversial issue in New Mexico and has attracted opposition from environmentalists in Texas because the site is so close to the state's borders and because much of the waste en route to the disposal site by truck and rail would pass through Texas.

The nuclear industry generally favors construction as a demonstration that deadly atomic wastes can be permanently isolated.

The energy department envisions disposing of the wastes, which must be isolated for thousands of years, in New Mexico salt formations almost half a mile below the ground.



A NOTE FROM

Frank B. Shants

1/22/80

Pat,

More on waste management...

FRANK

Bruce



# NUCLEONICS WEEK

RECEIVED

JAN 21 1980

Vol. 21 No. 3

January 17, 1980

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NUCLEAR DIV.

## CARTER EXPECTED TO DELAY PICKING WASTE SITE UNTIL '85, DEFER WIPP

President Carter is expected to make a policy statement on the management of nuclear waste within the next few weeks in which he will delay the selection of a high-level waste site until 1985 when several sites have been identified. This would defer construction of a high-level waste repository until 1988 and operation to 1992 to 1995, according to DOE calculations. The President is also expected to defer work on the Waste Isolation Pilot Plant (Wipp) and make it one of several sites to be considered in 1985. The Carlsbad, N.M., site is the most advanced DOE waste project and an exploratory shaft is scheduled to be sunk in July. Carter's selection of the "most leisurely" of the options suggested by the Interagency Review Group (IRG) on waste management is not a good sign for the nuclear industry, commented an industry source. The President is missing the urgency of the waste disposal problem in the public mind, he said. The American public wants a demonstration of high-level waste disposal technology soon. It will not be inclined favorably toward the building and licensing of more nuclear plants until it has received some reassurance, the source said.

The President also is said to be following the IRG recommendation that NRC be given licensing authority over nuclear waste sites, including transuranic or defense waste. Wipp had been authorized by the House and Senate Armed Services Committees as a DOE defense project and an amendment to the bill provided that DOE would be the only federal agency to review the project (NW, 20 Dec. 2). The President signed the authorization on Dec. 31, but indicated that he may not comply with the bill. The President's statement on waste policy is therefore expected to draw strong opposition from the House Armed Services Committee and Rep. Melvin Price (D-Ill.), who drafted most of the amendment language.

The committee will be asking the General Accounting Office, the investigating arm of Congress, to look into federal expenditures and see if any money was used for licensing, said a committee source. The money used for licensing after the President signed the bill will be disallowed, he added. The source also said a letter is being drafted to be sent to the President before he makes his nuclear waste management policy statement.

## TVA PLANS DEVELOPMENT OF ON-SITE LOW-LEVEL WASTE STORAGE SYSTEM

TVA, responding to a 50% cut in the amount of low-level waste the agency can store at Chem-Nuclear's Barnwell, S.C., site, has concluded the agency can store its low-level waste on site at a cost comparable to off-site storage. TVA is confident the waste can be stored above ground for the operational life of its plants, and perhaps longer.

TVA engineers in interviews with Nucleonics Week said they accelerated planning for on-site storage following Chem-Nuclear's "surprise" announcement that it was trimming TVA's Browns Ferry shipment of 100,000 cu ft/year to 50,000 this year because of new state restrictions placed on its license to store waste in South Carolina (NW, 8 Nov. 7). TVA had expected the cut some time in 1981. After considering staff recommendations on storage, the agency board adopted a policy of storing low-level waste from all its plants on site.

Beginning immediately the agency will store half of Browns Ferry's waste in existing space inside the plant and other buildings. The waste will be placed in 55-gal drums just as it is for shipment. The reduced shipments to Barnwell will consist mainly of resins, sources said. By December plans call for all low-level waste to be stored at Browns Ferry in specially designed concrete modules, each capable of handling a year's worth of waste as produced. The 55-gal drums will be used as containers.

By 1985 — sooner if possible — the plans call for a volume reduction system to be operating at Browns Ferry. The agency will gradually begin emptying the barrels from the modules and incinerating the stored waste. The reduced waste will then be placed back in the barrels — labeled for contact dose and curie level — sealed with epoxy or other sealant and placed back in the concrete modules. All handling of the waste will be done by remote control.

TVA sources estimate the capital cost for storage of life-of-plant waste at Browns Ferry as approxi-



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TWX ATOMIC FOR DC  
ZCZC01 COLLECT WASHINGTON, D.C. (1/22/80)  
TLX 730854 TX UTILITY DAL  
ATTN: DON J. HAMPTON

BT

TO ALL INFOWIRE SUBSCRIBERS:

1/22/80--IN HIS 75-PAGE STATE OF THE UNION MESSAGE, PRESIDENT CARTER WILL MAKE SEVERAL REFERENCES TO NUCLEAR POWER AND THE NATION'S UTILITIES. THE STATE OF THE UNION MESSAGE IS SCHEDULED FOR WEDNESDAY, JAN. 23, BUT CARTER PRE-RELEASED THE MESSAGE TO THE CONGRESS AND PRESS. FOLLOWING ARE EXCERPTS OF INTEREST.

ON ENERGY, CARTER SAID THAT "THERE IS NO SINGLE PANACEA THAT WILL SOLVE OUR ENERGY CRISIS. WE MUST RELY ON AND ENCOURAGE MULTIPLE FORMS OF PRODUCTION -- COAL, CRUDE OIL, NATURAL GAS, SOLAR, NUCLEAR, SYNTHETICS -- AND CONSERVATION." HE STATED LATER IN THE MESSAGE, "NUCLEAR POWER IS AN OPTION THAT WE SHOULD KEEP OPEN."

ON THE NUCLEAR REGULATORY COMMISSION: "I WILL SOON SEND TO CONGRESS A REORGANIZATION PLAN TO GIVE THE CHAIRMAN POWER TO SELECT KEY PERSONNEL AND ACT ON BEHALF OF THE COMMISSION DURING AN EMERGENCY. APPOINTMENT OF A NEW CHAIRMAN OF THE NRC FROM OUTSIDE THE AGENCY WHEN THE NEXT VACANCY OCCURS. IN THE MEANTIME, I HAVE DESIGNATED COMMISSIONER AHEARNE AS CHAIRMAN WITH A MANDATE TO INITIATE CHANGES NEEDED TO ASSURE THE SAFETY OF NUCLEAR POWER PLANT OPERATIONS. DIRECTION TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY TO LEAD ALL OFF-SITE EMERGENCY ACTIVITIES AND REVIEW ALL EMERGENCY PLANS IN STATES WITH OPERATING REACTORS BY JUNE. A REQUEST TO THE NRC TO ACCELERATE ITS PROGRAM TO PLACE A RESIDENT FEDERAL INSPECTOR AT EVERY REACTOR SITE, AND TO UPGRADE TRAINING AND EVALUATION PROGRAMS FOR REACTOR OPERATORS.

"I HAVE ENDORSED THE APPROACH THE NRC ADOPTED TO PAUSE IN LICENSING, BUT HAVE URGED THE COMMISSION TO COMPLETE ITS WORK AS QUICKLY AS POSSIBLE, AND IN ANY EVENT NO LATER THAN JUNE OF THIS YEAR.

"ONCE WE HAVE INSTITUTED THE NECESSARY REFORMS TO ASSURE SAFETY, WE MUST RESUME THE LICENSING PROCESS PROMPTLY SO THAT THE NEW PLANTS WHICH WE NEED TO REDUCE OUR DEPENDENCE ON FOREIGN OIL CAN BE BUILT AND OPERATED. NUCLEAR POWER IS AN OPTION THAT WE SHOULD KEEP OPEN."

ON WASTE MANAGEMENT: "THE PROBLEMS RELATED TO THE MANAGEMENT, DISPOSAL AND STORAGE OF NUCLEAR WASTES REMAINS ONE OF THE MOST SERIOUS PROBLEMS WITH NUCLEAR POWER. MY ADMINISTRATION HAS BEEN DEEPLY CONCERNED WITH THIS PROBLEM FOR THE PAST THREE YEARS. AN EXHAUSTIVE STUDY AND REVIEW OF THIS PROBLEM HAS BEEN UNDERTAKEN BY THE ADMINISTRATION OVER THE PAST YEAR.

"BASED ON THE FINDINGS AND RECOMMENDATIONS OF THAT STUDY, I WILL SOON BE PROPOSING TO CONGRESS COMPREHENSIVE LEGISLATION THAT DEALS DIRECTLY WITH THIS PROBLEM. MY PROPOSALS, IF ENACTED, WILL REPRESENT THE BIGGEST STEP FORWARD IN THE AREA OF NUCLEAR WASTE MANAGEMENT SINCE THE DAWN OF THE NUCLEAR AGE. I URGE CONGRESS TO TAKE ACTION IN THIS AREA THIS YEAR."



ON THE INTERNATIONAL NUCLEAR FUEL CYCLE EVALUATION, CARTER SAID "INFCE HAS DEMONSTRATED THAT SUPPLIERS AND RECIPIENTS CAN WORK TOGETHER. ITS RESULTS WILL BE PUBLISHED IN A MONTH. WHILE DIFFERENCES REMAIN, IT WILL PROVIDE A BROADER INTERNATIONAL BASIS FOR NATIONAL DECISIONS WHICH MUST BALANCE ENERGY NEEDS WITH NON-PROLIFERATION CONCERNS."

IN ADDRESSING THE INTERNATIONAL ECONOMY, CARTER SAID: "IN SUPPORT OF THE INTERNATIONAL OIL STRATEGY, THE ADMINISTRATION AND THE UNITED STATES COAL INDUSTRY ARE LAUNCHING JOINT MARKETING EFFORTS TO MAKE THIS COUNTRY A MAJOR EXPORTER OF STEAM COAL. WITH ASSURANCE OF RELIABLE UNITED STATES COAL SUPPLY AT COMPETITIVE PRICES, MANY OF THE ELECTRIC POWER PLANTS TO BE BUILT IN THE 1980S AND 1990S CAN BE COAL-FIRED RATHER THAN OIL-BURNING. COAL EXPORTS WILL HELP US PAY FOR OUR DECLINING, BUT COSTLY OIL IMPORTS."

HE ADDED: "WE CONTINUE TO BELIEVE THAT NUCLEAR POWER WILL PLAY AN ESSENTIAL ROLE IN MEETING THE ENERGY NEEDS OF MANY NATIONS, BUT WITH EFFECTIVE SAFEGUARDS AGAINST THE PROLIFERATION OF NUCLEAR WEAPONS."

ON U.S. UTILITY OIL USE REDUCTION, CARTER SAID THAT NEW LEGISLATION "WILL AID IN THE EFFORT TO REDUCE OUR RELIANCE ON OIL BY REQUIRING THE NATION'S UTILITIES TO SUBSTANTIALLY CONVERT FROM OIL TO COAL-BURNING OR OTHER ENERGY FACILITIES BY OUR NATION'S UTILITIES OVER A DEFINED TIMETABLE. THIS BILL IS A KEY TOOL IN OUR EFFORT TO INCREASE THE USE OF COAL, OUR MOST ABUNDANT NATURAL FUEL SOURCE."

WE WILL CONTINUE TO KEEP YOU INFORMED.

ATOMIC INDUSTRIAL FORUM  
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**SOLAR***(Continued from first page)*

sponsoring the solar project. As it is, the photovoltaic system powering the telephone gear probably will be switched back to reserve status for the remainder of the Olympics after the 1½-hour first run of the women's giant slalom is over. Indeed, to earn its brief place in the sun the photovoltaic equipment must survive one more series of tests, which were scheduled for this past weekend while participants in Wednesday's race were to go through trial runs.

"From a technical standpoint, there is nothing in the way of using [the photovoltaic system] more than it is

being used," said a NESEC official. "The barrier is not technical, it is human." Added Brian Fovel: "The perception of a lot of people here [on the Lake Placid Olympic organizing committee] is that solar energy is still experimental in nature. They don't want to be in any position where they're putting any kind of risk on an important event. Any of us who are involved technically see absolutely no risk. But there are people who are not technically minded who don't understand what is being done. It's that old cultural resistance to change."

## **DOE Pleads For Spent Fuel Storage Capacity By 1983**

*By Ann MacLachlan*

Momentum is building within the Department of Energy for a program to get away-from-reactor (AFR) spent fuel storage capacity on-line in the mid-1980s.

Data developed by DOE show that a number of U.S. reactors could be in serious trouble—to the point of having to cease operation—by 1983 if some AFR capacity is not available to supplement at-reactor storage pools. And even if utilities continue to solve their spent fuel problems by reracking and transshipments between reactor units, as they have for the past few years, the number of reactors that may have to operate without full-core reserve storage capacity on-site makes DOE officials nervous.

DOE sees operation of reactors without full-core reserve—and thus without operational flexibility—as a severe economic hazard, to the tune of a potential half-billion dollars in extra electric rates by 1994 if the situation does not improve.

Although Congress so far has not authorized the government to provide the AFR capacity (several bills to do so are in the works but stalled at various stages), DOE is proceeding in its investigation of potential AFR sites. The agency has almost finished preparing a report on sites it could have ready by 1983 or 1984, including the time needed for licensing and environmental activities. DOE Undersecretary John Deutch, in response to several inquiries from House and Senate energy leaders late last year, has committed the agency to holding hearings in the states where the sites are identified.

Although DOE once considered building its own AFR capacity and charging utilities for its use, time and money constraints have forced it to concentrate on existing AFRs. These are not numerous, nor are they very large. Out of an initial five sites identified in preliminary studies, DOE has fallen back to three. They are: the Nuclear Fuel Services facility next to the defunct West Valley, N.Y., reprocessing plant; General Electric's spent fuel pool next to its Morris, Ill., reprocessing plant, which never operated; and Allied-General Nuclear Services' much larger pool at its Barnwell, S.C., nuclear fuel reprocessing center, which is in political limbo but supported by Congress.

Barnwell can store about 400 MT now, with expansion possible to 1750-2250 MT; Morris' capacity is 350 MT, with possible doubling.

Although DOE once considered building its own AFR capacity from scratch and charging utilities for its use, time and money constraints have forced it to concentrate on existing AFRs. These are not numerous, nor are they very large; of an initial five licensed or nearly licensed facilities identified in a study last year, DOE has fallen back to three (although officials hope to find more potential sites).

Sites at the Todd Shipyards (a naval facility) in Texas and at Santa Susanna, Calif. (a DOE research facility) were ruled out as too small. The EMAD dry-storage experimental facility at the Nevada Test Site also was examined, but it is in initial stages of experimentation and wouldn't be available in the time needed.

The West Valley facility, where 600 gallons of liquid high-level reactor waste are stored already, is regarded as very small—only 85 metric tonnes of capacity are available—and potentially hot politically. Given that DOE is committed to a regional approach to nuclear waste management, chances are good that the agency will opt for acquisition of the Barnwell and Morris facilities.

What DOE needs for this is permission from Congress, which so far has not been forthcoming. With much fanfare, DOE submitted its AFR legislation to Congress in 1978; Congress has largely ignored it except to complain about the bill's revolving-fund provision, under which DOE would acquire AFR capacity for \$300 million but recoup that in fees to utilities using the capacity. However, the Senate Energy Committee has reported out a comprehensive nuclear waste bill that would give DOE interim authority to start an AFR program pending passage of a generic authority; the House's version of the DOE authorization directed a study of the AFR problem but declined permission to acquire capacity or enter into contracts with utilities.

According to the latest DOE data, even if all utilities reracked their storage basins to the theoretical maximum storage density, the AFR requirement in 1983 would be from 170-380 metric tonnes. A DOE study indicates that reracking is by far the least expensive option to solve the spent fuel storage problem—about \$8 per kilogram. But if new construction is required, AFRs

*(Continued on next page)*



**SPENT FUEL***(Continued from previous page)*

are cheaper (\$130 per kg) than new at-reactor storage pools (\$320 per kg).

During testimony last week before the Senate Government Operations subcommittee on energy, the Nuclear Regulatory Commission's fuel cycle chief, William Dircks, said reactors "might be forced to shut down" in 1983 if AFR capacity is not available.

Current utility data show that six reactors are operating without full-core reserve. They are: Oyster Creek; Dresden 1; Peach Bottom 2; Duane Arnold; Oconee 3; and Lacrosse. All of them plan to rerack from current capacity of about 1 1/3 cores—roughly equivalent to five or six years of operation—to capacity about double that. According to Dircks, all U.S. operating reactors have asked for a substantial increase in their storage pools and all new reactors have redesigned their pools to provide more capacity.

The older reactors were designed when it was believed spent fuel would go to reprocessing plants for extraction of usable plutonium and recycle in reactors. With the indefinite postponement of commercial reprocessing in the U.S., plus the President's reluctance to commit to an early waste disposal solution, the AFR storage issue has taken on new urgency. Some environmentalists have seized on AFR capacity as a federal "bailout" of utilities—in the belief the utilities should build the AFR capacity themselves—while others in the grassroots oppose the expansion of on-site spent fuel storage pools.

DOE now regards its AFR program, which began with high hopes

**Mineworkers Get New Vice President**

United Mine Workers of America President Sam Church has appointed Wilbert Killion union vice president, filling the vacancy created when Church took over the union from Arnold Miller. Killion, 58, is a member of the union's international executive board and will move to Washington from Brazil, Ind.; his UMWA career goes back to the days of John L. Lewis. Killion will direct the union's beefed-up organizing effort, which will move back to Washington from a small town in West Virginia, where Miller moved it to take it closer to the miners. The town is two hours from the nearest airport, Church said, making it difficult to direct the operation from Washington. At the press conference announcing Killion's appointment, Church said he was not only pulling the organizing team back to Washington but cancelling plans Miller had begun to move the headquarters out of Washington.

Killion ran for UMWA secretary-treasurer in 1972 on the ticket with then-president W.A. "Tony" Boyle, who subsequently was convicted of hiring killers to assassinate a rival in 1969. Killion lost in 1972 and was re-elected to the executive board in 1977. Several observers suggest that Church picked Killion for vice president in part because he would not be interested in running against Church when the UMWA again elects officers in December of 1982.

two years ago, as a "contingency," in the words of assistant secretary George "Woody" Cunningham. One DOE fuel cycle official said the agency is shooting for 500 MT of capacity available in 1983; part of this, presumably, would be open to foreign utility companies to aid President Carter's nonproliferation strategy by giving them an alternative to reprocessing. Cunningham estimates foreign fuel accepted for storage in the U.S. would amount to no more than 1,000 MT by 1990.

But with the lack of enthusiasm for the program in Congress, DOE sources say the AFR drive has lost its momentum. The agency is working hard on a final generic environmental impact statement on spent fuel storage, with release targeted for the end of next month. Once specific sites—at least two and maybe three—are selected, further EISs would require at least another year. Only after all the environmen-

tal documents *cum* public comment are finished will DOE be able to start work on licensing documents.

Still, DOE officials have not lost hope. Says one: "I think we'll have something available by 1983"; that "something"—its nature as yet unspecified—will suffice, it is hoped, to keep U.S. reactors from shutting down.

And as more reactors are cancelled and more utilities rerack at existing sites, projections of AFR capacity needs diminish. Said Cunningham last week: "As you go farther out in time, you project a need for a larger amount than is actually required when that time comes."

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*The Energy Daily was not published on Monday, February 18, due to the George Washington federal government holiday.*

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MORE ON PRES. CARTER'S NUCLEAR  
WASTE PROGRAM. . .

REGARDS,

FRANK B. SHANTS

FRANK

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# NUCLEONICS WEEK

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## PRESIDENT'S NUCLEAR WASTE PROGRAM ENCOUNTERS A FLURRY OF OPPOSITION

President Carter's long-awaited policy statement on nuclear waste management (see page 12) was delivered to Congress on Tuesday (Feb. 12). As expected, it was basically a conservative program, with the President deferring the selection of a site for a high-level nuclear waste repository until 1985; cancelling the Waste Isolation Pilot Plant (Wipp) in Carlsbad, N.M.; adopting the principle of consultation and concurrence with states on the siting of high-level waste repositories; and granting NRC authority over all licensing of high and low-level waste sites, both commercial and defense. The President also established a State Planning Council chaired by South Carolina Gov. Richard Riley to provide advice and recommendations to the President and Secretary of Energy on nuclear waste management, including interim management of spent fuel.

Immediately following the President's announcement Rep. Barry Goldwater Jr. (R-Calif.) denounced the President's program as based on a "medieval outlook that builds in years and years of delay. The President's policy has the nation going underground in a possibly endless quest for ultimate perfection in subterranean rocks or salt deposits. This activity was more appropriate for the ancient tomb builders and their catacomb construction," he said. Engineered barriers for waste are where the focus of attention should be, the congressman stated.

Rep. John Wydler (R-N.Y.) criticized the President's approach as "a giant step backward for the nation." He noted that in the last months of the Ford Administration the nation was committed to operate a waste repository in 1985. In the four years of the Carter Administration the schedule has been set back for a decade, he said.

Other members of Congress were perusing the President's program as Nucleonics Week went to press. However, several expressed reservations about the consultation and concurrence that the states would be given and how this would relate to federal preeminence. A source in the Senate Governmental Affairs Committee expressed concern about the point at which consultation and concurrence from the states could become a veto.

"When the [Interagency Review Group] report talked about consultation and concurrence, no one really understood it," he said, "and we have yet to figure out the permutations between the state's right to objection and the federal override. Rather than acknowledging the difficulties and trying to resolve them, the President has put off the decision and continued the confusion," the source said.

The source noted, however, that committee Chairman John Glenn (D-Ohio) agreed with the President that the selection of a high-level waste repository site should be stretched out. But, the source added, there are some reservations on the committee about the President's apparent emphasis on deep geological exploration. This seems to rule out other options, such as long-term monitored storage, which Glenn has advocated.

In the House Armed Services Committee a source said that "if the President wants to go his own lonely direction on cancelling the Wipp project, he can do so, but public law has created it (NW, 20 Dec, 2), and unless that public law is amended, the project cannot be cancelled. Wipp is the only viable waste disposal project DOE has and that is going to be abandoned."

A spokesman for a group representing diverse environmentalists and consumers praised the President's policy as one of the first major steps to developing a sound national policy. "It's very wise to terminate Wipp because it was a premature project given the controversy over salt as a suitable medium for a high-level waste repository," a source said. However, the source expressed reservations about the President's motives in announcing his waste management policy before the New Hampshire primaries this month. He noted that both Sen. Edward Kennedy (D-Mass.) and Gov. Jerry Brown of California oppose nuclear energy. With Seabrook in that state the nuclear issue takes on special importance, he said. "Is the President trying to demonstrate that he is in control of the nuclear debate? Is he trying to steal thunder away from his opponents? And if the President's motives are not strictly political, why has he let the report languish for nearly a year without any clear reason for the delay?" he asked.

At NRC, a source characterized the President's approach as entirely in line with the commission's draft recommendations on a high-level waste repository issued last December. "We're happy to see the consistency," he said. The scheduling of the repository involves many years between now and when it is available. But to the degree that multiple barriers within the repository are developed, the President is entirely consistent in emphasizing geological barriers, he said. — Alexandra Holubowich



briefed to the FERC commissioners by the end of March for a final decision.

In reaching his conclusion that decommissioning costs should be factored into the rate base, Benkin said, "The evidence is convincing that some elaborate decommissioning operation will be required. The evidence is convincing that the decommissioning will take place at the expense of the company, and the evidence is convincing that the cost of decommissioning will be substantial."

While the judge found that the precise decommissioning method is unspecified by NRC, and that exact costs are unknown, nevertheless, "the assurance that some cost burden will have to be borne owing to the need to decommission the plant, coupled with the equally sure prospect that the cost will be a substantial one, makes it prudent to begin now to collect from the ratepayers who benefit from Connecticut Yankee plant's electric power a fair contribution towards the eventual cost of decommissioning that facility."

**SECRECY HAS ENVELOPED THE RESIGNATION OF WPPSS MANAGING DIRECTOR** Neil Strand who joined the Washington Public Power Supply System in 1971. There is speculation that Strand's resignation was forced by several of the larger utility members of WPPSS. The announcement comes at a time when the state legislature is poised for an inquiry into cost increases and scheduling delays in WPPSS' construction of five nuclear plants. From an original \$4.1-billion the five units are now expected to cost \$11.8-billion. Strand has said that the cost increases have been beyond the control of management.

## **PRESIDENT CARTER'S STATEMENT OF NUCLEAR WASTE MANAGEMENT POLICY**

*Following is the verbatim text of the statement that President Jimmy Carter sent to Congress Tuesday (Feb. 12) of his policy on nuclear waste management.*

Today I am establishing this nation's first comprehensive radioactive waste management program. My paramount objective in managing nuclear wastes is to protect the health and safety of all Americans, both now and in the future. I share this responsibility with elected officials at all levels of our government. Our citizens have a deep concern that the beneficial uses of nuclear technology, including the generation of electricity, not be allowed to imperil public health or safety now or in the future.

For more than 30 years, radioactive wastes have been generated by programs for national defense, by the commercial nuclear power program, and by a variety of medical, industrial and research activities. Yet past governmental efforts to manage radioactive wastes have not been technically adequate. Moreover, they have failed to involve successfully the states, local governments, and the public in policy or program decisions. My actions today lay the foundation for both a technically superior program and a full cooperative federal-state partnership to ensure public confidence in a waste management program.

My program is consistent with the broad consensus that has evolved from the efforts of the Interagency Review Group on radioactive waste management (IRG) which I established. The IRG findings and analysis were comprehensive, thorough and widely reviewed by public, industry and citizen groups, state and local governments, and members of the Congress. Evaluations of the scientific and technical analyses were obtained through a broad and rigorous peer review by the scientific community. The final recommendations benefitted from and reflect this input.

My objective is to establish a comprehensive program for the management of all types of radioactive wastes. My policies and programs establish mechanisms to ensure that elected officials and the public fully participate in waste decisions, and direct federal departments and agencies to implement a waste management strategy which is safe, technically sound, conservative, and open to continuous public review. This approach will help ensure that we will reach our ob-

jective — the safe storage and disposal of all forms of nuclear waste.

Our primary objective is to isolate existing and future radioactive waste from military and civilian activities from the biosphere and pose no significant threat to public health and safety. The responsibility for resolving military and civilian waste management problems shall not be deferred to future generations. The technical program must meet all relevant radiological protection criteria as well as all other applicable regulatory requirements. This effort must proceed regardless of future developments within the nuclear industry — its future size, and resolution of specific fuel cycle and reactor design issues. The specific steps outlined below are each aimed at accomplishing this overall objective.

First, my Administration is committed to providing an effective role for state and local governments in the development and implementation of our nuclear waste management program. I am therefore taking the following actions:

— By executive order, I am establishing a State Planning Council which will strengthen our intergovernmental relationships and help fulfill our joint responsibility to protect public health and safety in radioactive waste matters. I have asked Governor [Richard] Riley of South Carolina to serve as chairman of the council. The council will have a total of 19 members: 15 who are governors or other elected officials, and four from the executive departments and agencies. It will advise the executive branch and work with the Congress to address radioactive waste management issues, such as planning and siting, construction, and operation of facilities. I will submit legislation during this session to make the council permanent.

— In the past, states have not played an adequate part in the waste management planning process — for example, in the evaluation and location of potential waste disposal sites. The states need better access to information and expanded opportunity to



guide waste management planning. Our relationship with the states will be based on the principle of consultation and concurrence in the siting of high-level waste repositories. Under the framework of consultation and concurrence, a host state will have a continuing role in federal decision-making on the siting, design and construction of a high-level waste repository. State consultation and concurrence, however, will lead to an acceptable solution to our waste disposal problem only if all the states participate as partners in the program I am putting forth. The safe disposal of radioactive waste, defense and commercial, is a national, not just a federal responsibility.

— I am directing the Secretary of Energy to provide financial and technical assistance to states and other jurisdictions to facilitate the full participation of state and local government in review and licensing proceedings.

Second, for disposal of high-level radioactive waste, I am adopting an interim planning strategy focused on the use of mined geologic repositories capable of accepting both waste from reprocessing and unprocessed commercial spent fuel. An interim strategy is needed since final decisions on many steps which need to be taken should be preceded by a full environmental review under the National Environmental Policy Act. In its search for suitable sites for high-level waste repositories, the Department of Energy has mounted an expanded and diversified program of geologic investigations that recognizes the importance of the interaction among geologic setting, repository host rock, waste form and other engineered barriers on a site-specific basis. Immediate attention will focus on research and development, and on locating and characterizing a number of potential repository sites in a variety of different geologic environments with diverse rock types. When four to five sites have been evaluated and found potentially suitable, one or more will be selected for further development as a licensed full-scale repository.

It is important to stress the following two points: first, because the suitability of a geologic disposal site can be verified only through detailed and time-consuming site-specific evaluations, actual sites and their geologic environments *must* be carefully examined. Second, the development of a repository will proceed in a careful step-by-step manner. Experience and information gained at each phase will be reviewed and evaluated to determine if there is sufficient knowledge to proceed with the next stage of development. We should be ready to select the site for the first full-scale repository by about 1985 and have it operational by the mid-1990s. For reasons of economy, the first and subsequent repositories should accept both defense and commercial wastes.

Consistent with my decision to expand and diversify the Department of Energy's program of geologic investigation before selecting a specific site for repository development, I have decided that the Waste Isolation Pilot Plant project should be cancelled. This project is currently authorized for the unlicensed disposal of transuranic waste from our national defense program, and for research and development using high-level defense waste. This project is inconsistent with my policy that all repositories for highly radioactive

waste be licensed, and that they accept both defense and commercial wastes.

The site near Carlsbad, New Mexico, which was being considered for this project, will continue to be evaluated along with other sites in other parts of the country. If qualified, it will be reserved as one of several candidate sites for possible use as a licensed repository for defense and commercial high-level wastes. My fiscal year 1981 budget contains funds in the commercial nuclear waste program for protection and continued investigation of the Carlsbad site. Finally, it is important that we take the time to compare the New Mexico site with other sites now under evaluation for the first waste repository.

Over the next five years, the Department of Energy will carry out an aggressive program of scientific and technical investigations to support waste solidification, packaging and repository design and construction including several experimental, retrievable emplacements in test facilities. This supporting research and development program will call upon the knowledge and experience of the nation's very best people in science, engineering and other fields of learning and will include participation of universities, industry, and the governmental departments, agencies, and national laboratories.

Third, during the interim period before a disposal facility is available, waste must and will continue to be cared for safely. Management of defense waste is a federal responsibility; the Department of Energy will ensure close and meticulous control over defense waste facilities which are vital to our national security. I am committed to maintaining safe interim storage of these wastes as long as necessary and to making adequate funding available for that purpose. We will also proceed with research and development at the various defense sites that will lead to the processing, packaging, and ultimate transfer to a permanent repository of the high-level and transuranic wastes from defense programs.

In contrast, storage of commercial spent fuel is primarily a responsibility of the utilities. I want to stress that interim spent fuel storage capacity is *not* an alternative to permanent disposal. However, adequate storage is necessary until repositories are available. I urge the utility industry to continue to take all actions necessary to store spent fuel in a manner that will protect the public and ensure efficient and safe operation of power reactors. However, a limited amount of government storage capacity would provide flexibility to our national waste disposal program and an alternative for those utilities which are unable to expand their storage capabilities.

I reiterate the need for early enactment of my proposed spent nuclear fuel legislation. This proposal would authorize the Department of Energy to: (1) design, acquire, or construct, and operate one or more away-from-reactor storage facilities, and (2) accept for storage, until permanent disposal facilities are available, domestic spent fuel, and a limited amount of foreign spent fuel in cases when such action would further our nonproliferation policy objectives. All costs of storage, including the cost of locating, constructing and operating permanent geologic repositories, will be recovered through fees paid



by utilities and other users of the services and will ultimately be borne by those who benefit from the activities generating the wastes.

Fourth, I have directed the Department of Energy to work jointly with states, other government agencies, industry and other organizations, and the public, in developing national plans to establish regional disposal sites for commercial low-level waste. We must work together to resolve the serious near-term problem of low-level waste disposal. While this task is not inherently difficult from the standpoint of safety, it requires better planning and coordination. I endorse the actions being taken by the nation's governors to tackle this problem and direct the Secretary of Energy to work with them in support of their effort.

Fifth, the federal programs for regulating radioactive waste storage, transportation and disposal are a crucial component of our efforts to ensure the health and safety of Americans. Although the existing authorities and structures are basically sound, improvements must be made in several areas. The current authority of the Nuclear Regulatory Commission to license the disposal of high-level waste and low-level waste in commercial facilities should be extended to include spent fuel storage, and disposal of transuranic waste and non-defense low-level waste in any new government facilities. I am directing the Environmental Protection Agency to consult with the Nuclear Regulatory Commission to resolve issues of overlapping jurisdiction and phasing of regulatory actions. They should also seek ways to speed up the promulgation of their safety regulations. I am also directing the Department of Transportation and the Environmental Protection Agency to improve both the efficiency of their regulatory activities and their relationships with other federal agencies and state and local governments.

Sixth, it is essential that all aspects of the waste management program be conducted with the fullest possible disclosure to and participation by the public and the technical community. I am directing the departments and agencies to develop and improve mechanisms to ensure such participation and public involvement consistent with the need to protect national security information. The waste management program will be carried out in full compliance with the National Environmental Policy Act.

Seventh, because nuclear waste management is a problem shared by many other countries and decisions on waste management alternatives have nuclear proliferation implications, I will continue to encourage and support bilateral and multilateral efforts which advance both our technical capabilities and our

understanding of spent fuel and waste management options, which are consistent with our nonproliferation policy.

In its role as lead agency for the management and disposal of radioactive wastes and with cooperation of the other relevant federal agencies, the Department of Energy is preparing a detailed national plan for nuclear waste management to implement these policy guidelines and the other recommendations of the IRG. This plan will provide a clear road map for all parties and will give the public an opportunity to review the entirety of our program. It will include specific program goals and milestones for all aspects of nuclear waste management. A draft of the comprehensive national plan will be distributed by the Secretary of Energy later this year for public and congressional review. The State Planning Council will be directly involved in the development of this plan.

The Nuclear Regulatory Commission now has under way an important proceeding to provide the nation with its judgment on whether or not it has confidence that radioactive wastes produced by nuclear power reactors can and will be disposed of safely. I urge that the Nuclear Regulatory Commission do so in a thorough and timely manner and that it provide a full opportunity for public, technical and government agency participation.

Over the past two years as I have reviewed various aspects of the radioactive waste problem, the complexities and difficulties of the issues have become evident — both from a technical and, more importantly, from an institutional and political perspective. However, based on the technical conclusions reached by the IRG, I am persuaded that the capability now exists to characterize and evaluate a number of geologic environments for use as repositories built with conventional mining technology. We have already made substantial progress and changes in our programs. With this comprehensive policy and its implementation through the FY 1981 budget and other actions, we will complete the task of reorienting our efforts in the right direction. Many citizens know and all must understand that this problem will be with us for many years. We must proceed steadily and with determination to resolve the remaining technical issues while ensuring full public participation and maintaining the full cooperation of all levels of government. We will act surely and without delay, but we will not compromise our technical or scientific standards out of haste. I look forward to working with the Congress and the states to implement this policy and build public confidence in the ability of the government to do what is required in this area to protect the health and safety of our citizens.

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A NOTE FROM

Frank B. Shants

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PAT -

HAD YU SEEN THIS  
ARTICLE?

REGARDS,

FRANK



Friday, February 29, 1980, DALLAS TIMES HERALD

# Chances dim for Texas nuclear waste dump

By ANDREW POLLACK  
Staff Writer

Texas' chances of being chosen for the nation's first nuclear waste dump have been decreased by a recent policy decision by President Carter and by scientific findings over the last few years, according to U. S. Energy Department and other government officials.

"It looks less and less likely the East Texas domes will be chosen," said a spokesman for U. S. Rep. Charles Wilson, D-Lufkin, who represents the area near Palestine that contains two underground salt domes under study as nuclear waste burial grounds.

Officials with the Energy Department's Office

of Nuclear Waste Management, while cautioning that the two East Texas sites and one in the Panhandle are still under consideration, agreed that the chances they will be chosen have diminished.

President Carter two weeks ago announced a research program aimed at selecting by 1985 the first repository for the poisonous wastes from nuclear power plants, which must be kept isolated for thousands, if not hundreds of thousands, of years.

Some 11 sites, including the three in Texas, are under study already, and press reports of the President's announcement seemed to indicate the choice would be made from among them.

But the President actually has postponed the decision on a burial site beyond the 1981 or 1982 date favored by the Energy Department and has

broadened the search to include other rock formations and other parts of the country. That narrows the chances that any of the 11 sites will be chosen, officials said.

"If we had to maintain a very tight schedule, the Texas salt domes would have been very important," said Bob Wunderlich, a project engineer for the Energy Department's nuclear waste management program. "The fact that we're including other media means that we may find something better than salt," he said.

Meanwhile, scientific studies of the Texas formations over the last three years already have eliminated two of five sites originally under consid-

See WASTE on Page 8

## Studies diminish chances of Texas nuclear waste site

WASTE — From Metro Page

eration and are threatening the remaining three.

In the Panhandle, two salt beds in the Permian Basin were being studied, along with similar formations in New Mexico and in Utah.

One of the Texas sites already has been eliminated because the salt deposits are not large enough, according to E. G. Wermund of the Bureau of Economic Geology at the University of Texas at Austin. And Wunderlich, who oversees salt bed investigations for the Energy Department, said the other site, south of Amarillo, might lose ground to the site in Utah.

"I can foresee the Permian (basin) will probably slip a little, (although) it may still be in the running by 1985," Wunderlich said. "The grade of salt and the understanding of the geology and hydrology is simpler" in Utah, he said. "Also, it's a desolate area."

In East Texas, three salt domes were chosen for study along with two domes in Louisiana and two in Mississippi. But one East Texas site was eliminated last fall and the studies have found potential problems with the other two. But those two — the Keechi dome six miles northwest of Palestine and the Oakwood dome, south of Fairfield on the border between Leon and Freestone Counties — are still under consideration.

Every year a nuclear power plant the size of the Comanche Peak project being built near Glen Rose generates 65 tons of hot, highly radioactive spent fuel containing such toxic substances as radioactive strontium, cesium and plutonium.

Figuring out how to keep those wastes away from people for centuries has been one of the most nagging problems surrounding the use of nuclear power. Right now, the wastes are stored alongside the reactors in large pools of water, but some power plants are running out of room and might have to shut down if new storage areas are not developed.

Ever since 1957, when the National Academy of Sciences recommended it, burying the wastes in underground salt formations has been the favored strategy.

In underground storage, a major goal is to keep the wastes away from groundwater, which could carry radiation into streams, lakes and water wells. Salt looked good, scientists say, because the mere fact it has been there for million of years means that there has been no water around. Otherwise, the salt would have dissolved. Salt also tends to seal itself when it cracks.

But scientists, including those at the U. S. Geological Survey, recently have raised questions about salt. One potential problem is that salt does contain tiny pockets of water that tend to move toward a hot object, like the nuclear waste. The water would be extremely salty and corrosive and could theoretically corrode the canisters containing the waste, said John Robertson, assistant chief of the geological agency's office of radiohydrology.

But Robertson said additional research might show that that and other potential problems with salt might not be serious. "I wouldn't be surprised if the first repository is in salt," he said.

Many scientists and other observers feel the nuclear waste problem will be decided more on political grounds than on technical ones. No one wants the stuff in his own backyard.

Such political considerations might lead officials to select one of two sites the government already owns and uses for purposes related to atomic energy. They are the Hanford reservation in the state of Washington, which already houses military radioactive wastes, and the Nevada nuclear bomb test site. Both are already under study as potential nuclear waste dumps.

To help deter the selection of an East Texas site, a group calling itself the Action Committee for the Retention of Environmental Safety formed in Palestine last fall. The group recently presented Gov. William P. Clements Jr. with a petition signed by 3,000 persons.

"We feel like if we wait until a site is chosen we'll have waited too long," said Mrs. LaLavne Grumbles, a founder of the group who lives above one of the underground domes.



# NUCLEAR WASTE:

## How will we manage it?

### A PUBLIC POLICY ISSUE

New Mexico is considered the cradle of the nuclear age with the development of the atomic bomb at Los Alamos and the explosion of the first one on July 16, 1945, near Alamogordo. New Mexico is among the leading uranium-producing states in the country, supplying about one-third of the uranium produced in the United States. However, there are no enrichment plants or commercial involvement with reactors, reprocessing or fabricating plants in the state. Now, with the federal government's proposal to locate a national repository for nuclear waste in salt beds 25 miles east of Carlsbad--the Waste Isolation Pilot Plant (WIPP)--New Mexico is being considered as a burial ground for some of the nuclear wastes produced during the past three decades.

Nuclear waste disposal is a public policy issue in all of the United States and of particular concern to the citizens of New Mexico. Many are employed in nuclear-related industries - from mining to research - and their economic well-being depends upon a resolution of the questions relating to nuclear waste disposal. They may live along the routes by which the radioactive material may be transported if it is to be deposited at WIPP. Although New Mexico is sparsely populated, its residents will live near the repository for wastes some of which will remain radioactive for a very long time.

The question of nuclear waste disposal has become a major issue in the nuclear energy debate which also includes the safety of nuclear reactors; the reprocessing of spent fuel rods by which plutonium, a material suitable for weapons, is separated and purified along with reusable uranium; the proliferation of nuclear technology among many countries; the need for nuclear energy in our economy; and the benefit-risk ratio of radiation.

The question of how to handle and isolate radioactive nuclear wastes has

not been addressed seriously as a public policy issue until recently. Meanwhile, the waste has been stored awaiting permanent solutions. The Interagency Review Group on Nuclear Waste Management (IRG), a task force with representatives from 14 federal agencies headed by the Department of Energy (DOE), submitted its report to the White House in March, 1979. It is expected that the Carter administration will use the IRG report as the basis for a comprehensive waste-disposal policy. One of its recommendations is that each state be allowed "consultation and concurrence" before a nuclear burial site can be located within its borders.

Final decisions and steps to implement the concurrence right are still being shaped. For New Mexicans, WIPP is one of the focal points of the debate. To participate in the debate citizens should be informed about:

- the criteria for nuclear waste disposal sites;
- the geological suitability of the WIPP site;
- the interactions between nuclear waste and the salt medium;
- the risks involved in testing these interactions over a long period of time;
- the retrievability of the wastes;
- type of waste to be disposed of at WIPP.

The nuclear waste disposal issue is often confusing. Reasonable people, experts and citizens alike, often disagree and maintain utterly divergent points of view.

The purpose of this booklet is to discuss in an objective and comprehensible manner the background of the issue, the generation of nuclear wastes, past and present waste management, the WIPP proposal, the need for a comprehensive waste management policy, and the role of the citizen in the decision process.

LEAGUE OF WOMEN VOTERS





## SOME BASICS

**URANIUM** is a naturally occurring element made up of large atoms. Natural uranium consists of 99.3% U-238 and about 0.7% U-235.

**TRANSURANIC ELEMENTS** are those elements heavier than uranium usually produced by intense neutron bombardment. Plutonium Pu-239 is one of the most important of these elements.

**RADIOACTIVITY** is the spontaneous disintegration of the nuclei of atoms causing the emission of radiation. Radioactive isotopes lose particles and energy by radioactive decay.

**IONIZING RADIATIONS** are gamma rays, alpha and beta particles, neutrons, protons or other nuclear particles.

**HALF-LIFE** of an isotope is the time it takes for one-half of the original quantity to decay. Each isotope has a unique half-life ranging from fractions of seconds to billions of years. Within 10 half-lives, one one-thousandth of the original radioactivity is left.

**NUCLEAR WASTE** is defined by the federal government as radioactive waste materials restricted by regulatory controls from discharge into

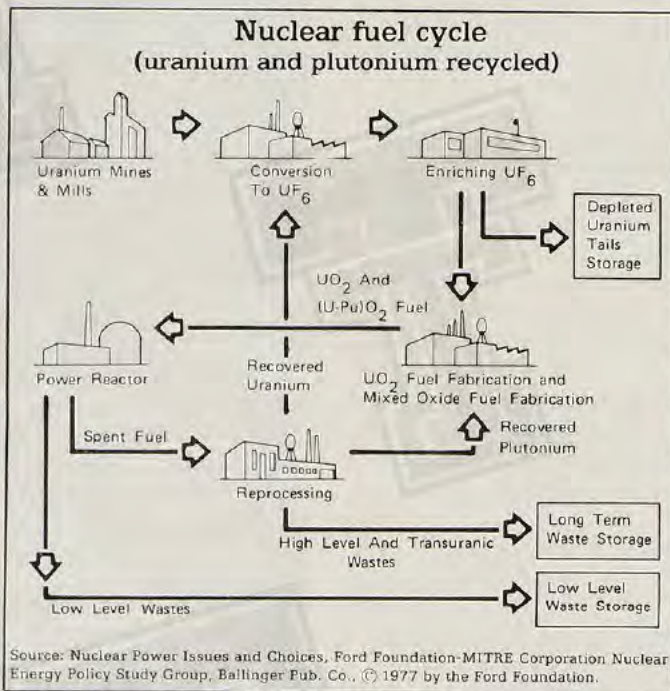
the general environment. Commercial spent fuel rods are considered waste at the present time, but if reprocessing were allowed they would yield unused uranium and plutonium.

**REPROCESSING** separates plutonium and uranium from fission products by chemical techniques.

**HIGH LEVEL WASTES** are either intact fuel assemblies that are being discarded after having served their useful life in a nuclear reactor (spent fuel) or the portion of the wastes generated in the reprocessing of spent fuel or similar nuclear material that contains virtually all of the fission products and most of the actinides not separated out during reprocessing.

**LOW LEVEL WASTES** have low, but potentially hazardous, concentrations or quantities of radio-nuclides and require little or no shielding.

**TRANSURANIC [TRU] WASTES** are currently defined as low level wastes containing more than ten nanocuries of transuranic activity per gram of material. This value is under review and may be revised upward.



## HOW ARE NUCLEAR WASTES GENERATED?

Nuclear wastes are generated during the nuclear fuel cycle, plutonium production and weapon fabrication. The starting point of the cycle is the **mining** of uranium. The usable uranium, about two to three pounds per ton of mined ore, is extracted by a **milling** process. Uranium, at this point called yellowcake, is then shipped to a plant for **conversion** to uranium hexafluoride  $UF_6$ , a solid. With

application of heat,  $UF_6$  becomes a gas and permits the concentration of U-235, the uranium isotope that is needed for reactor fuel. The next step in the cycle, the **enrichment** process, is used to increase the proportion of U-235 in the  $UF_6$ . In the fabrication process, the enriched  $UF_6$  gas is converted to solid uranium dioxide and formed into pellets. When these pellets are placed in zircalloy rods, the product is known as a fuel rod. The fuel rods are shipped to reactor sites where they are combined with control rods forming a fuel assembly. Multiple assemblies make up the reactor core. There the fissioning atoms sustain a **chain reaction**. By harnessing the energy released in such a reaction, it is possible to produce electricity and to power nuclear ships.

After a year or two, enough fission products have formed in the fuel rod that a sustained chain reaction is inhibited. A spent fuel assembly is then removed from the reactor, and placed underwater, with other spent assemblies, in large **storage pools** at the reactor site. At the present, it is at this point that the commercial fuel cycle stops in the United States. The next step in the fuel cycle, **reprocessing**, yields, among other products, plutonium, a major component for nuclear weapons. To preclude the possibility of plutonium being acquired by improper groups and being made into weapons, President Carter, in April, 1977, established a policy which prohibits commercial reprocessing of spent fuel rods. The U.S. defense establishment and several foreign countries do continue the fuel cycle by reprocessing. Their purpose is to salvage still usable materials, mainly uranium and plutonium. Defense reactors, in fact, produce plutonium as their primary purpose. After reprocessing, the uranium enters the fuel cycle again at the conversion plant. The plutonium goes on to be used for weapons, power sources and the space program. Materials left after uranium and plutonium are removed by reprocessing are considered wastes.



## LEVELS OF WASTES

There are several types of wastes generated at various points in the fuel cycle. There are no concise, generally accepted definitions for types of waste.

Low level wastes can be contact handled. Reactor cooling water, workers' protective clothing, shielding materials and tools which have come in contact with radioactive materials comprise the major kinds of low level wastes. These wastes contain less than ten nanocuries (nanocurie equals 37 disintegrations per second) of transuranic elements per gram, or they may be free of transuranic contaminants. Low level wastes are generated in almost all activities involving radioactive materials and are presently being disposed of by shallow land burial.

High level wastes must be handled remotely. The concentrated unusable material from defense reprocessing procedures comprise the major category of high level wastes. The current practice is to treat commercial spent fuel rods as high level wastes although much usable nuclear material remains in the rods. These wastes are being considered for disposal in geologic repositories or by other technical options designed to provide long-term isolation of the wastes from the biosphere.

Transuranic wastes result predominantly from spent fuel reprocessing, the fabrication of plutonium to produce nuclear weapons, and plutonium fuel fabrication for recycling in nuclear reactors. It would be considered low level except that it contains long-lived transuranic elements which require special isolation. TRU wastes may be contact handled. Currently wastes containing ten nanocuries or more of transuranic elements must be classified as TRU wastes. This level is currently under review and may be substantially raised. These wastes would be disposed of in a manner similar to that used for high level waste disposal.

Intermediate level is another classification of wastes sometimes used. These wastes require some shielding. They result mainly from the intermediate steps of separation at the reprocessing plant.

Uranium mine and mill tailings contain low concentrations of naturally occurring radioactive materials. The tailings are generated in very large volumes and are presently stored at the site of mining and milling operations.

## HOW MUCH WASTE EXISTS AND WHERE IS IT?

Commercial low level wastes are currently buried in six different locations. In 1977 the total volume of these wastes was about 16 million cubic feet. Of this quantity, 22% was buried at Barnwell, South Carolina; 12% at Beatty, Nevada; 3% at Hanford, Washington; 31% at Maxey Flats, Kentucky; 15% at Sheffield, Illinois; and 16% at West Valley, New York. These figures include a small amount of commercial TRU wastes. Defense related low level wastes totaled about 51 million cubic feet or over three times as much. This waste is buried at five major sites and numerous smaller ones. About 13% is buried at Hanford, Washington; 10% at Idaho Falls, Idaho; 17% at

Los Alamos, New Mexico; 13% at Oak Ridge, Tennessee; and 18% at Savannah River, South Carolina. The remaining 30% is mostly contaminated with uranium only. These figures include some TRU wastes.

The situation with respect to TRU waste is complicated by the fact that the treatment of this waste was changed in the early 1970s. Burial of DOE TRU waste ceased at most disposal sites in 1970 and at all DOE sites in 1974. In 1977 existing commercial TRU wastes totaled 123 kilograms with 12% buried at Beatty, Nevada; 18% at Hanford, Washington; 56% at Maxey Flats, Kentucky; 11% at Sheffield, Illinois; and 3% at West Valley, New York. The associated volumes are not known. The only site presently receiving commercial TRU waste for burial is Hanford. Defense-related TRU waste is either buried or retrievably stored. In 1977 about 15 million cubic feet existed. The transuranic content of this waste was something over 1100 kilograms. About 39% was located at Hanford, Washington; 24% at Idaho Falls, Idaho; 28% at Los Alamos, New Mexico; 2% at Oak Ridge, Tennessee; and 7% at Savannah River, South Carolina.

High level waste resulting from DOE defense and research and development (R & D) programs exists in a variety of forms at a number of sites. Total volumes of high level waste stored at the Savannah River, Idaho Falls, and Hanford sites equaled 9.4 million cubic feet in 1977. Liquids constitute about 40% of the current volume with salt cake and sludge representing nearly all of the remainder. About 65% is at Hanford, Washington; 4% at Idaho Falls, Idaho; and 31% at Savannah River, South Carolina. High level wastes have also accumulated through the operation of the only commercial reprocessing plant in the United States at West Valley, New York. These wastes are less than 1% of the previously discussed high level wastes and are stored in the form of liquids in two underground tanks.

A large reactor will produce 30 to 40 tons of high level waste (if spent fuel assemblies are to be considered as waste) per year. Existing quantities of high level wastes from commercial sources are estimated at 5000 metric tons in 1979. Current practice is to store spent fuel submerged in large pools of water at reactor sites. This on-site storage is considered a temporary measure. Once a final policy is developed on reprocessing and on disposal of nuclear wastes, the spent fuel rods will either be reprocessed or disposed of as wastes.

Uranium mine and mill tailings are generated in huge volumes compared to other types of nuclear waste. In 1978 the estimated volume of uranium mill tailings was 500 million cubic feet with new wastes being generated at a rate of 10 to 15 million tons annually. Although tailings are a natural product of mining and milling, they are hazardous because they contain long-lived radioisotopes and because they have been left in waste piles where humans may come in contact with them. Radon and radium are two radioactive elements in these wastes that are of particular environmental concern. Radon is a noble gas that escapes easily into the atmosphere from unstabilized mill tailings, whereas radium, its parent, is a potential pollutant of surface groundwaters. Due to the long half-life of thorium 230, the parent of radium, the quantity of radon and radium in the tailings will diminish by only one half in roughly 80,000 years.

*Thorium 230*



## POTENTIAL DANGERS OF NUCLEAR WASTES

The possibility of radiation exposure is a major issue of public concern in the nuclear energy and nuclear waste debates. Much is said about the risk factor involved with nuclear power and nuclear wastes. Yet it is important to recognize that every form of power used for energy production involves risk, from mining, refining, distribution, power generation, to transmission and handling of waste products. The advantages and disadvantages of each fuel source must be viewed in perspective.

All life is bombarded constantly by natural, or background, radiation. This radiation varies in intensity from place to place around the world and according to elevation. A person living at an altitude of 5000 feet receives nearly twice as much background radiation as a person living at sea level.

Besides naturally occurring radiation, man-made sources also increase the level of radiation exposure we experience. In the U.S. at present, the largest source of additional background radiation is from medical x-rays. Other sources of man-made radiation include fallout from weapons testing, cancer therapy, nuclear power generation, television, and even radium dial watches.

Additionally, there are several types of radioactivity, each with its own characteristics.

**Alpha radiation:** Most uranium isotopes and long-lived transuranics are alpha emitters. Although alpha radiation can be stopped by something as thin as a piece of paper, if a particle of alpha radiation bearing material is inhaled or enters an open wound, it can be hazardous. For example, if an alpha particle small enough to be deposited in the lungs were inhaled, radiation would tend to be absorbed locally in lung tissue. Concentrations of such radiation pose the potential for cancer. Since most alpha emitters have long half-lives, they must be isolated for very long periods.

**Beta radiation:** Most of the fission products which need to be stored are beta-emitters. Types of elements included in this category are strontium 90 (half-life 25 years) and cesium 137 (half-life 33 years). Beta radiation can be stopped by a thin sheet of metal; however, like alpha particles, beta emitters are termed "internal hazards" because their radiation can be dangerous if ingested or inhaled. The chemical similarities of some radioactive wastes to naturally occurring elements in the body make them particularly dangerous. For example, the chemical similarity of strontium 90 to calcium results in its concentration in the bones.

**Gamma radiation:** Most radioactive decay is also accompanied by gamma radiation. Gamma radiation is a wave form of energy which is more capable of penetrating material than either alpha or beta radiation. Protection from gamma rays is accomplished by shielding. The most effective kind of shielding is an appropriate thickness of dense material such as lead. Gamma radiation can transmit its radiation to critical organs within the body, even though it is not deposited in the body. Thus gamma radiation is called an "external hazard." Most of the higher levels of gamma radiation come from the beta emitters in nuclear wastes.

Theories differ on the effects of radiation on humans. Some scientists believe that radiation below a certain

threshold is safe. Others, however, hold that no radiation level can be considered harmless. The effects of large radiation doses given over short time spans are fairly well understood. High levels of radiation is one of the treatments for killing tissue; in fact, radiation is one of the treatments for killing cancerous growths. At the same time, high doses of radiation have produced cancers in test animals and man. Less is known about the effects of low doses of radiation received over prolonged periods of time, and what relation low levels of exposure might have to cancer. A number of factors—genes, hormones, injuries, chemicals, viruses, or radiation—probably act together to cause cancer.

Because we do not know what level of radiation exposure can be considered harmless, it is prudent in terms of health to control exposure to man-made radiation. In the case of some radioactive materials, steps necessary to shield humans and the environment are easy and need only brief attention. Other radioactive materials require strict and complicated measures and long-term vigilance. It is in the best interests of society that permanent solutions be found to the problems of nuclear waste disposal because current temporary methods are impracticable and unsafe for the long term.

## PRESENT WASTE MANAGEMENT PRACTICES

Nuclear wastes have been generated and stored for years. Presently most liquid wastes are stored in above-ground tanks and much solid waste is buried in shallow trenches. In the past the safe handling and storage of the wastes have not been given the high priority this problem is now receiving.

Wastes from plutonium production and spent fuel reprocessing at the Hanford Reservation in Washington and the Savannah River Plant in South Carolina have been kept in storage tanks. These wastes, which were acidic, have been neutralized by the addition of sodium hydroxide doubling the volume. Between 1958 and 1974, 18 of the original 149 carbon steel storage tanks at Hanford leaked, releasing 430,000 gallons of high level wastes. Hanford officials indicated that the released radioactive material has been contained in the soil and remains above the water table.

At Savannah River the tanks were built in concrete vaults with stainless steel liners 1.5 meters up the vault walls. The one instance of leakage, through the original tank, vault, and liner, released 100 gallons of high level waste into the surrounding soil. Savannah River officials have indicated that the liquids released would be absorbed in the soil or diluted many times by the on-site creeks and swamps and by the Savannah River before reaching water users.

In 1965, the use of evaporators was initiated at Hanford and Savannah River to reduce liquid volume by a factor of five by converting the waste to a damp salt cake. A process now also exists to convert the salt cake to glass.

At the Idaho National Engineering Laboratory (INEL) the wastes produced from spent fuel reprocessing were kept in their original acidic state and stored in corrosion-resistant stainless steel tanks. There have been no leaks. In 1963 INEL demonstrated that this liquid waste could be solidified by a high-temperature process and



converted to a sand-like product called calcine. This process reduces volumes by a factor of nine or ten.

The Oak Ridge National Laboratory (ORNL) in Tennessee generates up to two million gallons of radioactive liquid waste every year. The wastes are made alkaline in underground stainless steel tanks and the liquids concentrated by evaporation. Since 1966 the shale under ORNL has been fractured; wastes have been mixed with cement and injected into the fractures. About 1,600,000 gallons of concentrated waste solution mixed with cement has been disposed of at a depth of 800 to 900 feet through 1976. For the foreseeable future, about 90,000 gallons per year are expected to be disposed of in this manner.

Much solid waste is disposed of in shallow land burial grounds maintained by government laboratories or commercial firms. One such burial ground is located at Los Alamos Scientific Laboratory (LASL) in New Mexico. Here the waste is buried in large pits 400 to 600 feet long, 25 to 100 feet wide, and 20 to 40 feet deep with ramps for trucks at either end. After the pits are filled to within three feet of the top they are covered with earth, sealed, and mounded over with concrete.

Since 1970, transuranic waste has been stored in retrievable, plastic-lined drums of fiberglass-reinforced, polyester-coated, wooden crates. These drums and crates are stored in stacks on asphalt pads and covered with plywood, vinyl, and three feet of earth.

During the 1940s and 1950s the Atomic Energy Commission (AEC) issued commercial licenses for the disposal of low-level nuclear waste at sea. In 1960 the AEC stopped issuing new licenses or renewals, but allowed existing licenses to be used until they expired. The last sea disposal under these licenses was in 1970. There had been mounting public concern in, for example, the San

Francisco Bay area because of fear that strong tides in the area outside the Golden Gate, where large amounts of waste were being dumped, could carry them to shore.

At present, the nuclear power industry stores its spent fuel at reactor sites. As of now there are an estimated 5,000 metric tons of stored spent fuel in the U.S. and enough storage capacity to last until 1985. If the federal government continues its present decision not to reprocess spent fuel in order to help meet its nuclear weapons nonproliferation goals some more permanent storage capacity will be needed.

## DISPOSAL

The goal of nuclear waste management is, according to the IRG, "...to provide that: existing and future nuclear waste from military and civilian activities (including discarded spent fuel from the once-through nuclear cycle) can be isolated from the biosphere, and pose no significant threat to public health and safety." Meeting that goal, however, is a difficult question.

Some approaches to the long-term management of nuclear waste, considered by government agencies, politicians, scientists, and others are listed below. Note the distinction between storage, which assumes retrievability, and disposal, which does not. Some of these methods are now being used, some are ready to be demonstrated, and some are still being studied.

- • Use present storage facilities and replace them or build others.
- • Modify present storage facilities so that waste can be buried or entombed.
- • Store or dispose of waste in near-surface burial grounds.

## THE WEST VALLEY STORY

The only licensed commercial reprocessing plant for spent fuel is at a 3,300 acre site owned by New York State at West Valley, New York. This plant operated from 1966 until 1972. New York leased the site to Nuclear Fuel Services, Inc. (NFS) for the construction of a reprocessing plant and granted NFS \$8.5 million to construct nuclear waste storage tanks. While in operation, West Valley reprocessed 625 metric tons of spent fuel, 75% provided under contract by AEC from a Hanford, Washington, reactor, 15% from five northeastern utilities which had agreed before construction to use the service, and 10% from other utilities. A perpetual care fund was established by New York State. NFS contributes to the fund, which by 1980 will contain \$4.4 million. In 1972, NFS closed the plant for modifications and it has never been reopened. In 1976 NFS announced it was no longer in the reprocessing business because new government regulations and needed plant modifications (estimated in 1977 to cost \$615 million) made the plant no longer economical. Plant modifications were needed partly because of 67 radiation-exposure cases reported by the company to the Nuclear Regulatory Commission (NRC). To hold down employee exposure, NFS had employed many temporary

maintenance personnel.

At the West Valley site are two 750,000-gallon carbon steel tanks and two 15,000-gallon stainless steel tanks. (One of each is an unused spare.) The large tank contains 600,000 gallons of high-level nuclear waste in the form of liquid and sludge at 185°F. The small tank contains 12,000 gallons of liquid waste from a trial reprocessing of thorium fuel. The high-level waste at West Valley represents about 1% of the high-level waste in the U.S.

NFS has notified New York State that in 1980 the facilities at West Valley will revert to the state as provided by their contract. New York has asked DOE and Congress to make the West Valley site a federal waste storage site because New York does not have the expertise to handle it and because the AEC encouraged the plant's development. To date, NRC, responsible for commercial activities, has no comprehensive decommissioning criteria for such a plant and has asked DOE for assistance. DOE now plans to take over the site and the waste stored there if the state allows DOE to reopen the site's low level waste disposal below ground. Negotiations are under way on DOE proposals for financing of operations there.



- • Store or bury waste deep in the ground - in mined repositories, in deep drill holes, or in mined cavities in a manner that leads to rock melting.
- • Place containers in geologic formations deep in the sea floor or in deep drill holes in ice sheets.
- • Incorporate waste into synthetic rocks or crystals compatible with geologic formations into which they may be placed.
- • Send waste into deep space or into the sun.
- • Convert waste by transmutation into shorter-lived, less toxic materials by irradiation.

The permanent disposal method that has received the most attention for the longest time is storage or disposal of waste in deep continental geologic formations. As early as 1957 a National Academy of Sciences committee recommended that salt be considered as a host rock for radioactive wastes because of its thermal and physical properties and because some salt formations have existed for about 200 million years, indicating their past isolation from flowing ground water and the biosphere.

In 1963 Oak Ridge National Laboratory began the first significant study involving a particular salt formation in an abandoned salt mine near Lyons, Kansas. In 1972 the project was abandoned because 1) many test well drill holes, some no longer documented, penetrated the formation; 2) about 175,000 gallons of water mysteriously disappeared during a solution mining operation in a nearby mine; and 3) serious political objections were raised.

## WIPP

In 1975 the Waste Isolation Pilot Plant project (WIPP) was proposed for a salt formation near Carlsbad, New Mexico. The project is continually evolving. At the present time it involves the use of 17,200 acres of federal land and 1,760 acres of state land. Another 840 acres will be required for rights-of-way. Surface facilities for radioactive waste handling will require about 100 acres above ground. There will be extensive underground handling and storage facilities in the salt formation. The total cost of the operation would be about \$400 million and the site would employ 1300 to 1400 people during the construction phase and 400 people when fully operating.

The main objectives suggested by DOE for WIPP are to provide: 1) a facility for the permanent disposal of transuranic wastes; 2) a facility for experiments with various types of high-level defense wastes in an actual repository environment; and 3) a demonstration disposal with retrievable capacity of up to 1000 commercial spent fuel assemblies.

Waste disposal would be accomplished at two levels below ground in a large salt deposit. The great majority of the wastes received at the WIPP would be transuranic wastes, which do not give off much heat but have very long half-lives which require isolation for a quarter of a million years. Twenty-one hundred feet below the surface a disposal area of up to 2000 acres would be prepared for these TRU wastes with a degree of radio activity that allows their containers to be handled directly. The four million cubic feet of these wastes expected to have accumulated by 1985 would occupy about 94 acres. If, after 1985, these materials continue to be generated at the

current rate about 250,000 cubic feet per year they would require an additional six acres annually.

At the 2600-foot level, wastes which must be shielded during handling would be deposited. By 1985, 100,000 cubic feet of these wastes occupying about ten acres could be isolated in this area. If the current rate at which these wastes are generated persists after 1985, no more than an additional acre per year will be required. The 2600-foot level also could be expanded beyond 100 acres and made available for the lower level wastes if necessary.

Study is still needed on the behavior of deep geologic deposits when subjected to higher temperatures such as would be generated by radioactive material. The limitations of these geologic formations for repositories can best be determined by experiments underground in the actual repository, simulating conditions that could arise. This would be a major purpose of WIPP.

WIPP experiments would simulate the long-term disposal environment by subjecting the area to conditions such as higher temperatures caused by the high-level wastes and spent fuel. This would provide useful information for operating large-scale permanent repositories for these wastes at other locations.

A 20-acre area at the 2600-foot level would be devoted to these R&D activities. The surrounding environment would be closely monitored with instruments. All the material used in these R&D activities would be removed once the experimental program is completed.

It has been proposed that up to 1000 spent fuel assemblies discharged from the commercial nuclear power plants be stored at WIPP. Only spent fuel assemblies which have cooled for at least ten years would be used. This number represents about 10% of the total amount of spent fuel which would have been stored for ten or more years by 1985. Conducted at the 2600-foot level, the demonstration of spent fuel disposal would require no more than 20 acres.

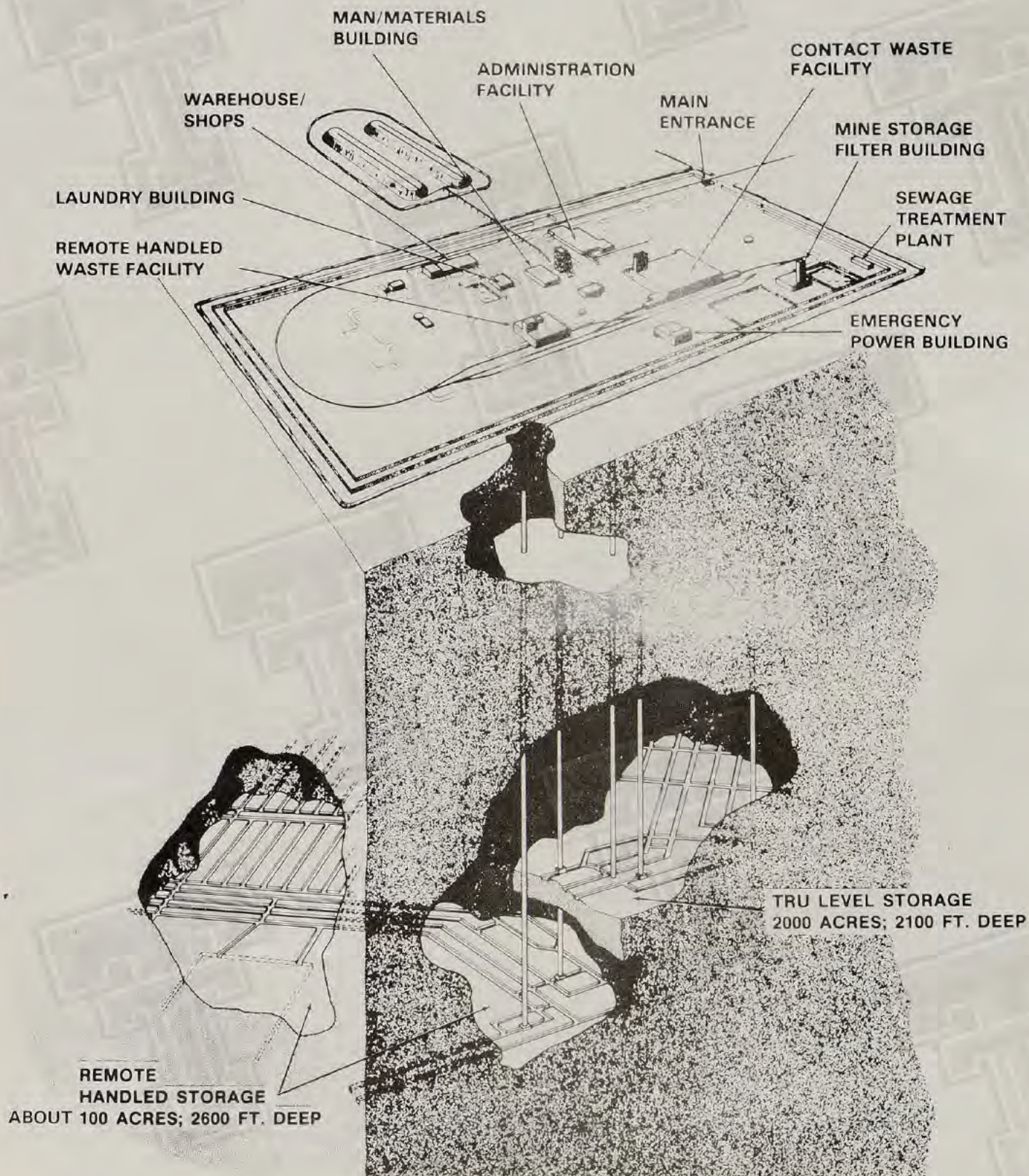
Additional study will determine whether the permanent disposal of commercial high level wastes in WIPP might be found appropriate and desirable. Any decision to dispose of commercial waste in this facility would require a formal licensing review, including an environmental review, approval of an amendment to the operating license issued by NRC and concurrence of the state.

Sandia Laboratories have prepared the conceptual design for WIPP and have prepared a draft environmental impact statement. Sandia Laboratories continue to pursue geotechnical characterization of the site and perform other technical supporting studies. Bechtel, Inc. and Westinghouse have been selected to prepare preliminary WIPP designs. Bechtel will provide architectural and engineering services and will produce preliminary designs. Westinghouse will provide technical support. The Westinghouse contract can be extended to cover technical support to those managing construction and to develop plans for plant operation.

In deciding the suitability of the WIPP site for nuclear waste disposal, one must understand its geology. The proposed WIPP site is located within a broad area known as the Delaware Basin. The basin is located in south-eastern New Mexico and west Texas, approximately 100 miles east to west and 150 miles northwest to southeast. Roughly 200 million years ago, the basin was under a shallow sea surrounded by a limestone reef called the Capitan reef. Under unusually arid climate conditions



# WASTE ISOLATION PILOT PLANT





water evaporated over a period of hundreds of thousands of years, leaving behind rock salt and other evaporites to a thickness of about 3600 feet. These salt beds were later covered with layers of other rock. A broad regional uplift which occurred between five to 30 million years ago caused the basin to dip down toward the southeast at a 2% slope, putting the southeast side of the reef 1 1/2 miles underground. There are aquifers (water bearing strata of rock) in the basin but none within the salt itself.

Breccia pipes and anticlines are two more of the significant geological phenomena in the area. A breccia pipe is a vertical underground column of broken rock that is more permeable to water than surrounding rock. An anticline is a very large mound of underground rock formed by intense pressure against rock strata. Anticlines in the Delaware Basin may contain gas and/or brine. Special precautions are being taken to choose a site some distance from these phenomena. The closest known anticline is three miles from the WIPP site. Holes in the area drilled during past explorations for gas, oil, potash,

etc., are being plugged with great care to assure they will not become conduits for water, which would serve to transport radioactive elements to the biosphere.

Questions have been raised by citizens, citizens groups and scientists about WIPP. Concern has been voiced about the site selected because of potentially valuable commercial natural gas and oil deposits which lie below the salt formation and potash deposits which lie above. A major concern of a large number of people is that this pilot plant project would be expanded into a full-scale waste repository without appropriate citizen input.

Some of the problems faced by a repository of this type have been identified in the IRG report. Issues of retrievability, accidents, flooding, heat stress, gas venting, humidity, and extremely long-term isolation all have to be faced and investigated before any method of disposal can be considered truly safe. The IRG also suggests that one appropriate strategy for nuclear waste management is to investigate other geological formations in addition to salt.

## WHO'S IN CHARGE? RESPONSIBLE FEDERAL AGENCIES

### ATOMIC ENERGY COMMISSION [AEC]

From 1946 to 1974, the AEC had responsibility for U.S. nuclear activities including authority to license privately owned facilities to use nuclear materials. In 1962, the AEC initiated the Agreement States Program, allowing states to enter agreements with the federal government to regulate all low level nuclear activities including certain low level commercial burial grounds within their boundaries. New Mexico became an Agreement State in 1974. The AEC retained the power to license commercial operators to dispose of transuranic waste. The Energy Reorganization Act of 1974 abolished the AEC, dividing its responsibilities between the Nuclear Regulatory Commission and the Energy Research and Development Administration.

### NUCLEAR REGULATORY COMMISSION [NRC]\*

Established in 1974, the NRC is an independent board whose members are appointed by the President. NRC regulates all U.S. commercial nuclear activities including management of high-level and transuranic waste.

### ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION [ERDA]

Between 1974 and 1977, ERDA was responsible for nuclear research and development formerly under AEC, including weapons production and energy development. With some exceptions, ERDA and its prime contractors were exempted from NRC regulations on national security grounds. In 1977 ERDA was abolished as an independent agency and its activities were absorbed into the Department of Energy.

### DEPARTMENT OF ENERGY [DOE]

Formed in 1977, DOE is responsible for nuclear

research and development, including research necessary to make policies concerning waste management, actual handling and storage of all defense wastes, and disposal of commercial high-level waste and/or spent fuel elements. DOE's Waste Management Office includes a Division of Waste Isolation responsible for site selection and research, development and demonstration work on a permanent repository; a Division of Waste Products in charge of waste handling and processing facilities for all types of civilian and military waste as well as decommissioning and decontamination work; and a Division of Fuel Storage and Transfer assigned to handling both interim storage facilities and availability of transportation systems. WIPP is within the Projects Staff of the Waste Management Office. DOE retains the authority to regulate its temporary waste storage and treatment activities.

### ENVIRONMENTAL PROTECTION AGENCY [EPA]

EPA is responsible for providing environmental radiation protection criteria and standards.

\*NRC is authorized to regulate commercial nuclear activities. DOE activities and those of its prime contractors are exempt from NRC regulation. Nevertheless, DOE has notified NRC of its intention to ask NRC to license the DOE's construction and operation of WIPP. Under current law this would not be necessary for the disposal of transuranic waste or for R&D with high-level defense waste and commercial spent fuel. If the project is expanded to demonstrate the ultimate disposal of commercial spent fuel assemblies, a license could be required.



## INSURANCE

No insurance policies written in the United States cover nuclear accidents. However, the Price-Anderson Act, passed in 1957, authorizes DOE and NRC to enter into indemnity agreements with contractors and licensee operating nuclear facilities. Through these indemnity agreements the insurance industry provides financial protection up to \$560 million per accident. DOE officials have said financial liability for WIPP-related nuclear accidents involving radiation contamination, both operation and transportation-related, would be assumed by the federal government under the Price-Anderson Act. The extent to which activities at a waste repository will be covered by a Price-Anderson indemnity agreement has not yet been established by the agencies involved and specific action will be required by them. Critics have raised legal questions on the issues of liability, exemptions and coverage stating that problems are not as easily resolved as DOE indicates.

## TRANSPORTATION

If WIPP becomes operative, the number of vehicles traveling New Mexican highways and railways carrying radioactive wastes will increase. According to 1978 Sandia Laboratories estimates, when WIPP is in full operation it is expected to receive 37 truck loads and 28 rail cars of TRU waste per week and one truck load per week and seven rail cars per year of high level waste. How will the wastes be packaged and transported? Under U.S. and international regulations, low level wastes require only normal industrial packaging for shipment and no special rail cars or other transport vehicles.

Transuranic wastes have very low levels of penetrating gamma radiation and so do not require heavy shielding. However, because of the long life and biological toxicity of plutonium and its potential for causing contamination of people or objects if released from its containment, TRU wastes require "accident-proof" packaging.

The emphasis in packaging transuranic waste for transportation is containment, with several containment barriers provided in the packaging system. Transuranic waste is shipped either in a large accident-proof box or in a bundle of 55-gallon drums encased in some sort of outer protective container to protect such materials from impact and fire.

High level wastes have a radiation level high enough to produce considerable heat, and the material must be heavily shielded during transportation. High level wastes probably will be solidified and shipped as inert, immobile material which is nonexplosive, noncombustible, and incapable of turning into gaseous form or becoming airborne.

→ The Department of Transportation (DOT) regulates shipment of all hazardous material, including nuclear shipments. NRC reviews commercial packaging designs to verify their adequacy.

→ To date, highly radioactive wastes from reprocessing have not been transported from their points of origin, although unprocessed spent fuel is shipped routinely. Packaging for these wastes is being studied and designed at Sandia Laboratories in Albuquerque, New Mexico, in preparation for a program of permanent disposal at selected sites. Before a specific package design is approved by NRC for shipment of commercial nuclear materials, it must be capable of withstanding, without leakage, a series of "torture tests" which produce damage conditions comparable to the actual damage a package might encounter in a hypothetical severe transportation accident. The accident damage test sequence specified in the DOT and NRC regulations includes a high-speed impact test, followed by a puncture test, followed by a fire test. A water immersion test is also required. Questions have been posed regarding the adequacy of the sample size testing for container failure during accident conditions, and the meeting of other scientific test criteria.

## TOWARD A COMPREHENSIVE WASTE MANAGEMENT POLICY

Congress has thus far exercised control over nuclear waste disposal only through appropriations. Specifically, in 1978 Congress disallowed funding for DOE to license WIPP, as an attempt to assure that WIPP would be constructed and operated only with specific Congressional approval. However, it is unclear whether a license is needed, and NRC has yet to set criteria for such licenses.

As part of the National Energy Plan, President Carter ordered a review of the U.S. nuclear waste management program. In March, 1979, the Interagency Review Group on Nuclear Waste Management (IRG) presented its report to the President but has not yet made its recommendations for the establishment of an Administrative policy with respect to long-term management of nuclear wastes and supporting programs to implement the policy.

The IRG report notes that the management of radioactive wastes for the past three decades has been characterized by inadequate integration of waste management R&D efforts with those for other parts of the nuclear fuel cycle. Additionally, the Presidential decision in 1977 to defer commercial reprocessing confronted the technical community with a potential waste form (spent fuel) about which much less is known as compared to the previous R&D effort on disposal of wastes from reprocessing. DOE has proposed a spent fuel policy under which the United States will accept and take title to domestic commercial spent or used fuel to be delivered at the user's expense to a government-approved storage site. A one-time storage fee charged to the user will be designed to cover the full costs of nuclear waste storage and ultimate disposal. Whether real costs can actually be determined is debatable. The United States has also agreed to accept limited amounts of spent fuel from foreign users to help meet nuclear weapons nonproliferation goals. Congressional action is needed to implement these policies.

IRG states that the primary objective of waste management planning should be to isolate all nuclear wastes from the biosphere and insure that they pose no significant threat to public health and safety. As its first technical objective IRG states that, "although zero



release of radionuclides cannot be assured, any potential releases should be within pre-established standards and, beyond that, be reduced to the lowest level practicable." The technology for waste disposal must be well understood and widely accepted, and the residual uncertainties recognized and provided for in the program structure. The IRG states as objectives that the paramount consideration of a waste management program must be the public health and safety, and responsibility for it should not be deferred to future generations. Appropriate allocations of cost should be made, but cost considerations should not dominate the design of the program system. Key elements in the decision-making process emphasized by IRG are:

- development of an overall plan to implement requirements of the National Environmental Policy Act (NEPA);
- development of criteria and standards;
- operation of the licensing process; and
- determination of facilities subject to licensing.

Much of the IRG report regarding WIPP is a response to the public comment on its draft statement in which WIPP was not thoroughly considered. The State of New Mexico commented that the IRG draft report failed to specify the nature of the relationship between generic long-term national policy recommendations and the implementation of specific near-term geologic disposal programs, conceivably WIPP. In its final report the IRG states that it "intends to address this question in its recommendations to the President and is still in the process of formulating its views on the matter," and reiterates that a TRU repository should be licensed and that legislation is required to accomplish this.

Another aspect of the IRG draft which generated substantial comment was the recommendation for states' "consultation and concurrence." The IRG final report defends its recommendation of "cooperative federalism" or "consultation and concurrence" in which the state is involved in an on-going dialogue and cooperative relationship in every phase from planning through operation and decommissioning. The state would be in agreement with each step in the process before the next activity was begun. This approach, the IRG states, "will lead to better protection of the States' interests than would a system of State veto by which is usually meant that a State approves or disapproves of Federal activities at one specific moment." States would not be allowed to bar all nuclear waste disposal in advance, but would have to consider each proposal individually.

Prior to the publication of the IRG report, many states, including New Mexico, expressed concern over their right to veto proposed nuclear waste repositories within their boundaries. In fact, at least seven states, including Michigan, Louisiana, South Dakota, Vermont, Georgia, South Carolina, and Idaho, have taken action to ban location of nuclear waste repositories in their states. Critics of the consultation and concurrence recommendations have questioned whether the state or federal government best exercises the responsibility for public health and safety. Another criticism leveled is that consultation and concurrence is an attempt to obtain early agreement from the states to federal activities which states would later find difficult to terminate.

Meanwhile, the state of New Mexico has been assured by DOE that it does have the right of concurrence to the WIPP project. The state has been given a DOE grant to conduct an independent review and evaluation of the

project and has established an Environmental Evaluation Group for WIPP under the State of New Mexico Health and Environment Division to carry out this project. The 1979 Legislature passed the Radioactive Waste Consultation Act to implement the right of concurrence by providing a mechanism for the state to negotiate with DOE over WIPP, and providing for ultimate state concurrence with the federal plan. The act creates a state task force made up of the Chief State Highway Engineer, and the Secretaries of Energy and Minerals, and Health and Environment. This task force is directed to negotiate with the federal government in all areas related to the site, and licensing and operation of federal radioactive waste disposal facilities. An interim legislative committee is also created and assigned the duty of examining all matters pertaining to the issue of radioactive waste disposal. It is directed to "make a recommendation regarding state consultation and concurrence, including procedures, methods and times at which the consultation and concurrence should be exercised," and to report to the 1981 Legislature. A bill giving the state Environmental Improvement Board exclusive authority to develop regulations governing the transportation of nuclear wastes on New Mexico highways also passed the 1979 Legislature.

## THE ROLE OF THE CITIZEN IN THE DECISION PROCESS

➤ Citizens can and should play a part in decision-making on public issues. Since the nuclear waste issue is often a highly technical one, the job of citizens is difficult, but not impossible. While it is important to become as informed as possible on the technical points involved, average people probably do not have time to understand the technical issues as well as the scientists. The area in which citizens can be most effective is in their expression of their concerns **as citizens.**

The prerequisite to citizens' having an effect on the decision process is being informed. Not only is it important to be conversant with the issues, but also to be aware and stay current with the steps, procedures and timetable planned for the decision process.

Finding out which elected and appointed officials have responsibility in the entire process is an important step. Knowing when and how to express one's views to the appropriate person can maximize the effectiveness of citizen comments. Since many of the final policy decisions on nuclear waste disposal will be made at the federal level, citizens should write directly to officials in the Executive Office of Science and Technology (the President's science advisers), and the Division of Energy Technology in DOE, and to their representatives in Congress. Citizens should also attend and participate in public hearings held by DOE and other government agencies.

Continued public dialogue, through hearings, conferences, media coverage and even letters to the editor can be significant aids to public understanding of the nuclear waste disposal issue. Citizen voices need to be heard as a part of that public dialogue.



## TO JOIN OR NOT TO JOIN

Organized groups can amplify the voices of concerned individuals. In the time since WIPP was first proposed, many such groups have formed; most have weighed in on one side or other of the debate. When deciding whether or not to affiliate with a group effort, an individual would want to consider:

- What is the purpose of the organization?
- Has the group taken a position on the issue? Is that position compatible with personal position/concerns?
- Are the statements of the group based on fact?
- On emotion?
- What is the composition of the group? What interests does it represent? Does it have a narrow or wide base of members?
- How is the organization financed?
- Has the organization taken any positions on related issues?

Whether citizens are involved as individuals or as members of organizations, the key to effectiveness is persistence. Because the wheels of the public policy decision process grind exceedingly slowly, the citizen has to be able to hold out for the duration.

Once the decisions are made, it is not the end of the line for citizen involvement. Monitoring and implementation of public policy is as important a step as those leading up to decisions. Only through monitoring can citizens assure themselves that policies achieve desired ends and the intent of decisions is realized.

## ACRONYMS

AEC	United States Atomic Energy Commission
DOE	United States Department of Energy
DOT	United States Department of Transportation
EPA	United States Environmental Protection Agency
ERDA	United States Energy Research and Development Administration
IRG	Interagency Review Group on Nuclear Waste Management
NEPA	National Environmental Policy Act
NFS	Nuclear Fuel Services, Inc.
NRC	United States Nuclear Regulatory Commission
R&D	Research and Development
TRU	Transuranic wastes
WIPP	United States Department of Energy, Waste Isolation Pilot Plant Project

## RECOMMENDED READING

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Cohen, Bernard. "The Disposal of Radioactive Wastes from Fission to Reactors," *Scientific American*, Vol. 236 (June, 1977), pp. 21-31. Attempts to put radiation risk in perspective in what some people consider an optimistic manner.

Lash, Terry R., John E. Bryson and Richard Cotton. **Citizens' Guide: The National Debate on the Handling of Radioactive Wastes from Nuclear Power Plants.** (November, 1975), Natural Resources Defense Council, Inc. 664 Hamilton Ave., Palo Alto, CA 94301. This citizens' information handbook from a respected environmentalist group is useful.

Lindenfield, Peter. **Radioactive Radiations and Their Biological Effects.** Michigan State University, 1977. 65 pp. Available from American Association of Physics Teachers, Graduate Physics Building, SUNY at Stony Brook, Stony Brook, NY 11794.

United States Executive Office of the President, Energy Policy and Planning. **Report to the President by the Interagency Review Group on Nuclear Waste Management.** (March, 1979) TID-29442. 235 pp. \$10.75; **Subgroup Report on Alternative Technology Strategies for the Isolation of Nuclear Waste (Draft).** (October, 1978) TID-28818. \$9.50. Available from National Technical Information Service (NTIS) U.S. Department of Commerce, 5285 Port Royal Rd., Springfield, VA 22161. The IRG Report to the President with summaries of public comment will serve as a basis for national nuclear waste disposal policy.

United States Department of Energy. **Report of Task Force for Review of Nuclear Waste Management (Draft).** (February, 1978) DOE/ER-0004/D. This describes the DOE's WIPP program and has much basic information on present and projected amounts of nuclear waste.

Weaver, Kenneth F. "The Promise and Peril of Nuclear Energy," *National Geographic Magazine*, Vol. 155 (April, 1979), pp. 459-493. Readable overview, good illustrations.



### **NUCLEAR WASTE: HOW WILL WE MANAGE IT?**

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ISSUE OF NUCLEAR WASTE: VIDEO TAPE PRESENTATION

League of Women Voters: Lubbock, Texas

Submitted: 10/20/79

Patricia Bruno  
Wanda Walser

The question of nuclear power

SYNOPSIS



## SYNOPSIS

The question of nuclear power as an energy source is so complex and so controversial, it's like a giant ball of yarn which gives an appearance of being in some sort of order on the surface, but which, upon unraveling, proves to be extremely tangled.

One of the strands of this ball of yarn--nuclear energy--is nuclear waste, a subject increasingly as complex as the bigger issue of which it is a part. So, how can people judge?

It will be our purpose to present a macro-view of this particular subject, then, while avoiding the parent issue of nuclear energy itself.

In our production, we will examine four general aspects of the question of nuclear waste: the urgency of the issue itself, the use of time in connection with nuclear waste, the question of delay in disposal of nuclear wastes, and the factors which determine the time spans of disposal decisions.

Within each of these four areas, we will attempt to provide the general public with a clear, layman's terms view of each specific area within these larger areas.

A brief, tentative outline to production approach is attached. We hope to present our material in an informative, yet interesting way.



## OUTLINE

Why do people litter? We can't really say. Different people litter for different reasons and in different ways. What's litter to one person isn't necessarily litter to another. But, this one simple fact...people do litter... has become a significant issue in the past few years because it threatens our ecology, our health, our existence.

So, we don't answer the question anymore of why people litter. Rather, we turn to a side issue: what do we do with the litter that's here?

Of an even more vital nature is the question of nuclear power as an energy source. It's a question too complex to deal with directly. Rather, we choose to deal with a specific relative of the issue: what about nuclear wastes?

How dangerous is nuclear waste and how long do we have to find some answers to the question? What are the characteristics of nuclear waste in terms of human health and survival because of toxicity, exposure and contamination?

And...if we can do ~~an~~ something about nuclear waste...how safe are the solutions we choose? What about natural disasters in connection with nuclear waste? How will we allow for human error...oor, can we? And, then there are technical failures. Can we learn to work with technical failyres? Can we offer fail safe procedures?

Then, we must ask ourselves what nuclear waste and the solutions to its containment or disposal will do to our environment...land values as well as the air we breathe.

Some people think "we"...the American government and those pro-nuclear... are stalling for time. They ask, "What have we got?" They say, "Tell us what we can do."

There are several possibilities. Isolate wastes. To examine that, we must ~~examine~~ examine how nuclear wastes are generated....(history, commercial, defense).



Can nuclear wastes be contained? If so, how? (interim storage; accidents of escape.) What about disposal of nuclear wastes? (terminal solutions and specific projects.)

Do we have options? (solidification; vitrification.)

What are some disposal suggestions? How safe are they? (geologic burial, salt, basalt, turf, granite, shale, outer space, sun, deep ocean trench, melting into arctic ice <sup>cap</sup> ~~cap~~.)

~~different~~ <sup>Many</sup> With so many apparent ideas to choose from and so many learned people ~~different~~ some apparently feasible ideas, why don't we do something? Why do we continue to dally? Why doesn't the government do something?

Some say the technology isn't advanced enough to insure safety. Others say that's not the question; there are other factors. One of the problems? Not even the experts can agree. And, it's a crisis situation in more ways than one. The country is at the end of her energy options.

The government doesn't do something because the government doesn't work well against deadlines. The issue of nuclear wastes has been a low priority item. Actually very little money has been invested in research...so say some. Others say there's no point in trying to achieve perfection...no point in spending more and more on research. The time to make the decision is now... from data already collected.

Technology, assumed at one time, to be able to handle the problems, has been weighed in the <sup>balance</sup> ~~scale~~ and found lacking. And, interim solutions to nuclear wastes have been found to be unsatisfactory.

Then, of course, there's the story of too many cooks and ~~only~~ one pot of soup. A "committee" decision...too many voices in the decision-making process...special interest groups, lobbyists and others...have greatly confused the issue.



*At this*  
~~At this~~ point, the citizenry are distrustful of governmental capability in dealing with nuclear wastes. More questions are being asked, less answers are being accepted, particularly in view of the raised environmental consciousness of the people.

And, the very thing we're doing now--communication in an effort to clarify--has, sadly, contributed to the confusion, since in today's world media dissemination and almost instant communications allows scrutiny perhaps before some are ready.

Can we ever expect a decision? If so, when? First we must examine how policy is formulated (construction, erosion of concept.)

What are the ingredients...the recipe, if you will, for a decision? Economics: too expensive to keep; too expensive to scrap. How liable are we for the moneys we spend to find solutions? How feasible are expenditures?

Public opinion is another ingredient. Hearings, presumably held to increase public awareness serve only to muddy already murky waters. Public demonstrations pro, con and in-between, on an issue, draw attention to it, but often fail to provide any real basis for public decision making.

Politics, of course, always enters in. Special interest groups present cases for their causes...i.e. industry vs. environmental...sometimes with little apparent concern for the situation as a whole.

Legislation/regulation is an issue on the issue where power bases struggle for ultimate control of a situation, i.e. federal vs. states rights.

Until at last we find that what we think, say and do has global implications. We are no longer speaking of our children, your children, our home, your world, but of mankind as an entity. Will nuclear wastes and what we do or don't do with it affect our defense, our national security?

To summarize: there are no "pat" answers. What we present here can provide no answer. What we can do, what we hope to accomplish is a simple unraveling



of the facts, a straightening, if you will, of what's involved.

We will present a discussion of all facets of the question of nuclear wastes...so that, in the end, each person viewing the production might have been given some real insight, some tangible evidence on which to draw his own conclusions, and help himself, his country and his world in his own way.



(2)

DISS. INTO GRAPHIC OF NUCLEAR SYMBOLS AND KEY TERMS AS THEY ARE MENTIONED: historical, technical, political, socio-ethical.

NARRATOR

We will talk about the history of nuclear waste; the technical implications, the political and the socio-ethical.

DISS. TO VTR SCENE #1 (KEY DATE OVER SCENE)

NARRATOR

How did we come to have the problem of nuclear waste? Where did nuclear waste begin and from what.

DISS. TO GLOBE IN LIMBO. SFX, stars, light patterns. Begin w/LS GLOBE; SLOW INTO TIGHT SCREEN of globe turning..

( NARRATOR'S VO MUSIC LOW BG, space type)

Radioactivity and nuclear fission are as old as time itself. It is quite natural to us to think of gas, oil or solar energy...yet today, many people are afraid of the "NUCLEAR", although it is as natural as either of the other two.

Radiation is present all around us...in the earth's crust...in ground water...in our air.

DISS. TO TIGHT SCREEN: rocky ground. Hand reaches down and picks up rock, PULL OUT FOR LS as silhouetted person throws rock into space.

NARRATOR

Rocks and soil contain uranium and thorium...a substance associated with rare earths and most commonly found in metallic substances. Thorium and uranium produce different radioactive elements through radioactive decay.

CUT TO VTR SCENE #2: Milling of uranium ore, if possible.

(KILL MUSIC)

NARRATOR

When we mill uranium ore, there is always a certain amount of radiation

present...and when we use rock...like granite from these millings, we build a certain amount of radiation into the structure we construct.



(3)

DISS. TO: Woman in kitchen cooking.

~~Even~~the things we take for granted...natural gas used in home furnaces

NARRATOR

Even the things we take for granted....natural gas used in home furnaces and kitchen ranges produces a kind of radioactivity...random, which we inhale through the lungs.

DISS. TO MEDICAL CENTER: Radiology Technician

NARRATOR

We use X-Rays and nuclear medicine to treat illness and disease; we use radiation in various diagnostic tests....

DISS TO GLOBE IN SPACE, AS IT SPINS, IT DISS TO:

NARRATOR

No, we can't get away from a certain amount of nuclear wastes. They are a natural result of the build up and decay of certain components of our earth. And, if they've always been there... why haven't we learned better what to do about them. Let's take a trip back through history.

ART CARD: TIGHT SCREEN: Early lab scene, Marie Curie. PULL OUT TO SHOW ENTIRETY.

KEY 1895, CENTER

NARRATOR

In 1895, in Germany, Wilhelm Roentgen discovered X-RAYS...radiation which could travel through metal sheets. At about the same time, in France, Henry Becquerel wrapped a small piece of uranium compound in a black paper and placed it on top of a similarly wrapped photographic plate. When he developed the plate, Becquerel discovered it was black. Something had penetrated the paper.



(5) DISS. TO SYMBOL FOR RADIATION. FULL SCREEN, simple animation, if possible or some kind of special effect.

(MUSIC UP & DOWN)

NARRATOR

We could take much more time to examine the miracles of nuclear discover, but we must limit ourselves. Let's talk about some terms you've probably been hearing.

DISS. TO VTR SCENE #3 (people working in labs or working w/uranium and radium in some way) KEY TERMS CENTER SCREEN AS THEY ARE USED.

NARRATOR

Let's talk about ALPHA PARTICLES.

Alpha particles are properties of many of the heaviest nuclear species... like uranium and radium. These particles are really "rays". They are easily absorbed into ordinary paper.

Alpha particles are relatively harmless because they lose their energy through a process known as "~~xxxxxxx~~ ionization", a stripping of electrons from surrounding atoms.

BETA RAYS, or beta radiation, is another form of radiation emitted by radioactive substances. They are more penetrating than Alpha rays. Beta rays can be absorbed by simple sheets of aluminum.

GAMMA RAYS or gamma radiation...are extremely penetrating rays which are really the same thing as X-Rays.

DISS TO VTR SCENE #4 (Bomb at Los Alamos)

NARRATOR

Even though radiation and nuclear wastes have been around for thousands of years, even though ~~discovery~~ early discoveries brought many things to light, the world got its first real look at things nuclear in December 1942...when the first nuclear power plants "sprang" up almost overnight.



(4) CUT TO ECU Marie Curie, PULL OUT TO SHOW: her early lab

NARRATOR

Also in France, Marie and P  rre Curie worked diligently on another experiment. They wanted to produce uranium...chemically. Through their experiments, they discovered that residues from their chemical operations were more radioactive than purified uranium.

Theirs was the discovery of radium, and the knowledge that radium is produced by the radioactive decay of uranium.

DISS. TO GRAPHICS: TERMS AND SYMBOLS FOR THE NUCLEAR CENTER SCREEN.

NARRATOR VO MUSIC

Madame Curie invented the term "radioactivity" to describe this process. It's in her honor that Ci..."curie"...the name for one unit of radioactivity...is used. One curie is the amount associated with one gram of radium.

DISS AGAIN TO EARLY LAB SCENE

NARRATOR

These nuclear pioneers soon discovered that exposure to penetrating radiation could be dangerous. Madame Curie's husband, Pierre, decided to use himself to determine just how dangerous.

DISS . TO ECU M Curie

NARRATOR

He strapped a small piece of radium to his arm and kept it there ten hours. His skin reddened. In 20 days, scabs had formed and 52 days later, the burns still were not completely healed. This experiment was not the cause of M Curie's death, however. He was killed when was run down by a horse-drawn carriage. *Carriage*

(5) DISS. TO SYMBOL FOR RADIATION. FULL SCREEN



(6)

VTR SCENE #5 (ATOMIC POWER PLANT Pantex?)

NARRATOR

These first power plants nursed huge atomic piles inside lead-shielded walls. Inside these units, plutonium was created as the basis of materials for the bomb that was to come.

VTR SCENE #6 (50's & 60's)

NARRATOR

Since that December, nuclear power and resulting wastes have been constant sources of news and controversy. Today, we're bombarded with the pros, cons and in-betweens of the issue.. and the question is: WHAT TO DO ABOUT THE WASTES? The power itself is already here. This brings us out of the historical portion of the program and in to the second sphere: the technical aspects of nuclear wastes.

VTR SCENE #7, KEY TERMS AS THEY ARE DISCUSSED.

NARRATOR

We experience nuclear waste from two primary sources.

ONE: DEFENSE WASTES. Defense wastes are those resulting from defense programs and research and development and related activities of the Department of Energy.

These wastes include: Low level wastes, high level wastes and transuranium wastes. Categories of nuclear waste are determined by "nanocuries"...37 disintegrations per second of radioactive elements. Remember that one curie equals one unit of radioactivity.

FOR THE FOLLOWING NARRATIVE SEQUENCES, GRAPHICS WILL BE USED.

NARRATOR

Transuranium wastes are those containing elements with atomic numbers higher than uranium. They are primarily Alpha radiation, and can be contact handled.

High Level wastes are those extracted from irradiated fuel during reprocessing. These are high intensity, penetrating and of long-lived radioactivity. These must be handled by a remote device.

*Low level wastes are all other wastes than Transuranium and High Level. Intermediate wastes as yet have no official definition but require some shielding.*



NARRATOR

The second source of nuclear wastes is COMMERCIAL WASTE. These wastes are Spent fuel elements, Low Level Wastes, High Level Wastes and Transuranium wastes.

Spent fuel elements...the uranium rods used in powering nuclear plants, once used become themselves, a form of nuclear waste and must be dealt with accordingly.

DISS TO GRAPHIC: Diagram of fuel cycle.

NARRATOR

How are nuclear wastes generated? Look at this diagram.

The cycle begins with the mining of uranium. One ton of mined ore yields about two to three pounds of usable uranium which must be extracted in a milling process.

The extracted uranium is called yellow cake. The yellowcake is shipped to a plant and converted into uranium hexafluoride..  $UF_6$ , a solid.

Once heated,  $UF_6$  becomes a gas and allows the concentration of U-235, the uranium isotope that is needed for reactor fuel.

Next, the enrichment process increases the proportion of U-235 in the  $UF_6$ . During fabrication, the enriched  $UF_6$  gas is converted to solid uranium dioxide and formed into pellets. These pellets are placed in zircalloy rods, and this is then known as a fuel rod.

The fuel rods are shipped to reactor sites and there combined with control rods to form a fuel assembly. Multiple of these assemblies form the reactor core. There the fissioning atoms sustain a chain reaction. When this energy is harnessed, it's possible to produce electricity and to power nuclear ships.

After one or two years' use, enough fissions have formed in the rods that a sustained chain reaction is inhibited, and the spent fuel rod is removed and placed under water with other spent fuel rods. These are known as storage pools.



(8)

At this point, in the united States, the commerical fuel cycle stops. The next step in the fuel cycle is reprocessing which yields plutonium, a major component for nuclear weapons.

In 1977, President Carter established a policy which prohibits commercial reprocessing of spent fuel rods. The purpose...to prevent the possibility that plutonium might be acquired by the wrong groups and made into weapons.

The U.S. Defense establishment and some foreign countries do continue the fuel cycle by reprocessing. They want to salvage still usable materials ...primarily plutonium and uranium.

After reprocessing, the uranium again enters the fuel cycle at the conversion plant.

The plutonium becomes weapons, power sources and is used in the space program. Anything left after uranium and plutonium are considered wastes.

DISS. TO MAP, USE SFX TO POINT OUT EACH LOCATION ON MAP, AS IT IS TALKED ABOUT.

NARRATOR

At present, COMMERCIAL low level wastes are buried in six places: Barnwell, South Carolina; Beatty, Nevada; Washington; Maxey Flats, Kentucky; Sheffield, Illinois, and West Valley, New York.

DISS. TO TITLE: DEFENSE LOW LEVEL WASTES

NARRATOR

DEFENSE LOW LEVEL WASTES are much greater in volume and are buried in five major places and several minor sites:

CUT TO MAP ONCE AGAIN; SFX EACH SITE AS IT IS MENTIONED

NARRATOR

The major sites are: Hanford, Washington; Idaho Falls, Idaho; Los Alamos, New Mexico; Oak Ridge, Tennessee; Savannah River, South Carolina



(9) *Cut To: Nuclear waste roll in colors to represent per centages as they are mentioned -*

NARRATOR

Of the current nuclear waste volume, LIQUIDS make up about 40 per cent. Salt cake, sludge and spent fuel rods represent almost all the remainder. Currently, spent fuel rods are...as was mentioned before...submerged in pools of water at reactor sites. This is considered a temporary measure. When a final decision is reached as to disposal, the spent rods will either be disposed of as waste or reprocessed.

CUT TO NUCLEAR FAMILY TREE GRAPH TO DESCRIBE THE FOLLOWING:

NARRATOR

Uranium mine and mill tailings, although not considered wastes are of concern in the nuclear waste issue, because they ~~these~~ contain low concentrations of naturally occurring radioactive materials.

DISS. TO MINE SCENE *A9* —

NARRATOR

The tailings are generated in large quantities. These are presently stored on site at mining and milling operations. Here's why they are of such concern:

CUT BACK TO FAMILY TREE, USE CU'S to emphasize each property mentioned.

NARRATOR

Mill Tailings contain Radon and Radium, two radioactive elements of environmental concern. Radon is a noble gas that escapes easily into the atmosphere. Radium, the parent of radon, is a potential pollutant of surface groundwater.

Thorium 230 is the parent of Radium. The half life of these daughters is 80,000 years. Half life is the amount of time it takes for the isotope to lose exactly half its radioactivity.



NARRATOR

We will now discuss some of the measures taken to contain or dispose of nuclear wastes. As we discuss these possibilities, we'll be hearing from people around the country with varying opinions on these questions within the question.

VTR SCENE #10....STORAGE FACILITIES

NARRATOR

Presently most liquid nuclear wastes are stored in above ground tanks, and most solid wastes is buried in shallow trenches.

CUT TO GRAPHIC, CUT-AWAY OF STORAGE TANK

NARRATOR

The liquid wastes are highly acidic. Most of them are neutralized by the addition of sodium hydroxide. This doubles the volume of the liquid waste.

ON GRAPHIC, ANIMATION OF SEEPAGE FROM TANK

NARRATOR

Between 1958 and 1974, at Hanford...18 of the original 149 carbon steel tanks leaked. This released nearly half a million gallons of High Level waste into the soil. Officials there claim the wastes have remained above the water table.

At Savannah River, the tanks are composed of double walled steel liners set in four foot thick cement shells. They have had one leak. This resulted in the release of 100 gallons of high level waste into the ground.

What do experts have to say about this?

VTR SCENE #11.... SPEAKER.... (REASSURANCE, APPX. 3:00--5:00 ; KEEP VTR SCENE,

BRING IN NARRATOR VO

NARRATOR

There are differing opinions. \_\_\_\_\_ of  
\_\_\_\_\_ says....

VTR SCENE #12....SPEAKER...WARNING, APPX. 3:00--5:00.



(11) ,CUT TO GRAPHIC, DIAGRAM OF CONVERSION OF WASTES TO OTHER FORMS. POSSIBLE SIMPLE SWITCHER ANIMATION AS EACH ONE IS DISCUSSED  
NARRATOR

About 15 years ago, waste officials began to convert the liquid wastes to other forms for more convenient...possibly safer containment. Here's one way they did it:

Evaporators were used to reduce the liquid volume of the wastes by a factor of five...the waste was converted to a damp salt cake.

Now, a process exists which can convert the salt cake to a glassine form. This process is called glassification...vitrification... or solidification, depending on what the salt cake is converted to. Ceramics, glass and tektite...and a mineral matrix...are all currently under extensive research. What do the experts say about this?

DISS. TO VTR SCENE #13...SPEAKER...REASSURANCE...APPX 3:00--5:00, KEEP VTR (Use key: name/title speaker)  
SCENE, BRING NARRATOR VO"

NARRATOR

Again, there are differing opinions...

CUT TO VTR SCENE #14...SPEAKER...WARNING...APPX 3:00--5:00, KEEP VTR SCENE, BRING (use key; name/title/speaker)  
NARRATOR VO

NARRATOR

There are other forms which can be/are being used to contain nuclear wastes at present.

CUT TO GRAPHIC OF INEL/OAK RIDGE...

NARRATOR

At Idaho National Engineering Laboratory...INEL...the nuclear wastes were burned into a dandlike substance called calcine. This reduces the waste by a factor of nine or ten. At Oak Ridge National Laboratories, the wastes are evaporated, mixed with cement, and injected into fractures in the shale formation unberneath the lab....  
*a depth of 800 - 900 feet -*



proposed  
The first such/burial site was to be near Lyons, Kansas. The project was abandoned in 1972 because of water disappearance, undocumented drill holes and public outcry.

CUT TO VTR SCENE #16: WIPP, NEW MEXICO

NARRATOR

In 1975, a waste isolation pilot plant...WIPP...was proposed for a salt formation near Carlsbad, New Mexico. Currently, this project involves about 20,000 acres, mostly federal and state owned. Surface facilities will require about 100 acres, with extensive underground handling.

KEY OBJECTIVES OVER SCENE #16

NARRATOR

WIPP HAS THREE MAIN OBJECTIVES: One: to be a permanent facility for transuranic wastes. Two: To be a facility for experiments with various types of high level defense wastes in an actual repository environment. Three: to be a demonstration disposal site with capacity for up to 1000 spent fuel rods.

KEY FIGURES OVER SCENE #16,,AS OBJECTIVES ARE MENTIONED

WIPP wastes would be deposited at two levels: 2100 feet and 2600 feet.

(13) CONTINUE SCENE #16. KILL KEYS. NARRATOR VO SCENE

NARRATOR

We still need to study the behavior of deep geologic deposits subjected to high temperatures like than generated by radioactive materials. Many feel that WIPP could help determine these limitations, that it would experimentation in a real underground repository... and that until we have that, we have only theory.

CUT TO VTR SCENE #17, SPEAKER...REASSURANCE.... 5:00--6:00. KEEP SCENE. PUT NARRATOR VO

NARRATOR

Of course, still others believe that deep geologic burial is as dangerous and as unneedful as any other disposal method.



NARRATOR

At present, the government is studying eight basic options for storage or disposal of nuclear wastes:

One: continue use of interim storage; build more temporary facilities

Two: Modify present facilities to entomb or bury wastes

Three: Store wastes in surface burial grounds

Four: Put nuclear wastes into deep geologic repositories...deep drill holes or deep mined cavities...criteria for these possibilities is being developed..

Five: Place containers in deep drill holes in the ocean floor or in the arctic ice sheets

Six: Fire wastes into deep space or into the sun

Seven: Incorporate wastes into synthetic rocks or crystals compatible with their geologic formation

Eight: Convert wastes by transmutation into shorter-lived, less toxic materials. Do this by irradiation.

CUT TO GRAPHIC TITLE: GEOLOGIC FEASIBILITY

NARRATOR

Right now, the most technologically feasible approach to containment of NW appears to be deep geologic burial.

CUT TO VTR SCENE #15, SITE, IF POSSIBLE OR FOOTAGE SHOWING HOW THIS IS ACCOMPLISHED

NARRATOR

The first such proposed burial site was to be near Lyons, Kansas. The project was abandoned in 1972 because of water disappearance, undocumented drill holes and public outcry.

CUT TO VTR SCENE #16: WIPP, NEW MEXICO

NARRATOR

In 1975, a waste isolation pilot plant...WIPP...was proposed for a salt formation near Carlsbad, New Mexico. Currently, this project involves about 20,000 acres, mostly federal and state owned. Surface facilities will require about 100 acres, with extensive underground handling.



13  
CUT TO VTR SCENE #18...SPEAKER...WARNING...5:00--6:00. KEEP SCENE. PUT

NARRATOR VO: (KEY SPEAKER'S NAME/TITLE OVER SCENE WHILE HE/SHE IS SPEAKING)

NARRATOR

Part of the WIPP would be the research and development area.  
This area would be very closely instrument monitored. Only  
spent fuel assemblies which have cooled for at least ten years  
would be used at the WIPP. There is still debate.

CUT TO VTR SCENE #19. KEY SPEAKER'S NAME/TITLE WHILE SPEAKING. CUT AUDIO. KEEP  
SCENE, USE NARRATOR VO.

NARRATOR

Where is the WIPP located?

CUT TO GRAPH SHOWING LOCATION/ROCK FORMATIONS

NARRATOR

It's located in the Delaware Basin. The Delaware Basin is a  
salt formation 3600 feet thick. It was laid down approximately  
two million years ago. There are aquifers within the basin, but  
none within the salt itself.

political —  
1. dump sites  
in Tex and  
New Mexico —  
2. WIPP



(14) DISS. TO SECOND GRAPH SHOWING STRATA AND LAYOUT OF WIPP

NARRATOR

There are two other unusual geologic conditions in the area...the presence of breccia pipes and anticlines.

KEY IN ARROW POINTING OUT BRECCIA PIPES.

NARRATOR

Breccia pipes are vertical underground columns of broken rock that is more permeable to water than is surrounding rock.

MOVE ARROW TO POINT OUT ANTICLINES ←

NARRATOR

An anticline is a very large mound of underground rock formed by intense pressure against rock strata. Anticlines in the Delaware Basin may contain gas and/or brine. Special precautions are being taken to assure a site a distance away from the presence of anticlines and breccia.

DISS. TO THIRD GRAPH SHOWING PRESENCE OF WIPP/GEOLOGIC PHENOMENA

NARRATOR

The closest known anticline is three miles from the WIPP site. Holes once drilled in explorations for gas, oil, potash and other fuels are now being plugged carefully to assure they won't become conduits for water which-would serve as a transport for radioactive elements into the biosphere.

CUT TO VTR SCENE #19

NARRATOR VO

Throughout Texas and New Mexico...where ever potential disposal sites have been publicized, questions have been

*next page*



raised. Citizens are concerned about several things. p. 19 -

(15)

DISS. TO GRAPH SHOWING OTHER NATURAL RESOURCES

One: What about the natural resources which lie below the earth's surface....for instance...in the case of the WIPP: Commercial natural/<sup>gas</sup> and oil deposits, which lie below the salt formation...and the potash deposits which lie above?

CUT TO VTR SCENE #20

NARRATOR VO

What frightens so many people is this: they are afraid that a project such as WIPP might be implemented on a pilot basis and later be expanded to a full scale nuclear waste repository...with out enough input from the citizens of the particular area. This, in turn has led to the asking of other questions:

KEY ISSUES OVER SCREEN AS THEY ARE MENTIONED. KEEP SCENE #20

NARRATOR VO

What about retrievability of deposited nuclear wastes in case they are needed or should be moved?

What about accidents from nuclear wastes deposits?

What about flooding both above and below ground?

What about heat stress, gas venting, humidity and extremely long-term isolation of nuclear wastes.

Here's what one citizen had to say:

CUT TO VTR SCENE #21 (KEY NAME/TITLE/AREA) ASSURANCE 5:00--6:00

NARRATOR VO LAST FEM SECONDS

*There are others who feel that the risks are too great.*



(16) CUT TO VTR SCENE #22 (KEY NAME/TITLE/AREA) WARNING 5:00-6:00

NARRATOR VO LAST FEW SECONDS

One of the big issues concerning nuclear waste is that of transportation...from point of origin to repository. Many people are frightened of what could occur between these two points.

CUT TO VTR SCENE #23 (TRANSPORTATION)

NARRATOR VO

For instance...if WIPP becomes operative, New Mexico highways will see an increased number of vehicles carrying radioactive wastes. So will the railways. Here are the estimates according to a 1978 Sandia Laboratories estimate:

CUT TO GRAPH DEPICTING LOADS RECEIVED AT WIPP

NARRATOR

If WIPP goes in to full operation, it's expected to receive: 37 truck loads and 28 rail cars of TRU wastes per week. Also: one truck load per week and seven rail cars per year of high level wastes

CUT TO GRAPHICS DEPECTING INTERNATIONAL REGULATIONS

NARRATOR

What is a good way to package and transport the wastes? Under U.S. and international regulations, low level wastes require only normal industrial packaging for shipment... they do not require special rail cars or other transport vehicles.

CUT TO GRAPH SHOWING TRU WASTE LEVEL PENETRATION

NARRATOR

TRU wastes don't require heavy shielding. They have very low levels of penetrating gamma radiation. BUT...TRU wastes do require ACCIDENT PACKAGING...because of their long life and the biological toxicity of plutonium and its potential contamination of people or objects when it's released from its packaging.



NARRATOR

To transport <sup>TRU</sup> ~~TRU~~ wastes...extreme containment will be stressed and several containment barriers will be provided in the packaging system. Transuranic wastes will be shipped either in a large "accident proof" box or in a bundle of 55-gallon drums, each ENCASED IN some kind of outer covering or protective container to protect TRU materials from impact and fire.

CUT TO GRAPHICS DEPECTING HLW

NARRATOR

High level wastes must be heavily shielded during transportation because of their radiation levels which produce a great deal of heat. They probably will be solidified and shipped as inert, immobile material which is nonexplosive, noncombustible and which cannot become gaseous or airborne.

CUT TO VTR SCENE #24 (REGULATION)

NARRATOR

There is, of course, regulation concerning the transportation of all hazardous materials, including nuclear wastes. The regulation begins with D.O.T....the Department of Transportation. Next, the Nuclear Regulatory Commission reviews commercial packaging designs to verify their adequacy.

CUT TO VTR SCENE #25

NARRATOR

As a matter of fact...to this point in time...highly radioactive from reprocessing wastes/have NOT been transported from points of origin to repositories. But, it's a matter of routine to ship unprocessed spent fuel.

CUT TO VTR SCENE #26 (LABORATORIES)

NARRATOR

Sandia Laboratories in Albuquerque, New Mexico is currently studying packaging for these wastes and designs are in the offing in preparation for permanent disposal at selected sites.

CUT TO VTR SCENE #27

NARRATOR

In order to be approved by NRC, however, these designs must first withstand several "torture" tests which produce damage conditions similar to what a package might actually encounter

*in a hypothetical  
severe transportation  
accident*



(18) CUT TO ANIMATED GRAPHICS DEPECTING TESTS

NARRATOR

These tests..specified in the DOT and NRC regulations...include a high-speed impact test, a puncture test and a fire test. A water immersion test is also required. Container size..its adequacy concerning capacity and its ability to meet accident conditions and other scientific test criteria...is studied.

CUT TO VTR SCENE # 28

NARRATOR

What about insurance? What happens in a real-life accident situation? Is there some way to recoup damage or at least offer recompense to those involved?

CUT TO VTR SCENE #29

NARRATOR

No insurance policies written in the United States cover nuclear accidents. BUT...in 1957, the Price-Anderson Act was passed. This legislation~~s~~ authorizes The Department of Energy (DOE ) and The Nuclear Regulator Commission (NRC) to enter into indemnity agreements with contractors and licensee operating nuclear & facilities.

CUT TO VTR SCENE #30

NARRATOR

Through these particular agreements, the insurance industry provides up to 560 million per nuclear accident. DOE officials have said that financial ~~xxx~~ liability for WIPP related nuclear accidents involving radiation contamination, both~~x~~ operation and transportation related, would be assumed by the Federal Government under the Price-Anderson Act.



Cut to VTR Scene #31 -

However...just how much these agreements, according to the Price-Anderson Act...will & cover have not yet been established by the agencies involved, and their specific action will be required to set such policy. Critics have raised legal questions on the issues of liability, exemptions and coverage, stating that problems are not as easily resolved as DOE indicates.

CUT TO VTR SCENE #32 (KEY NAME/TITLE/AREA OF PERSON) 5:00-6:00 A38MX WARNING

NARRATOR VO LAST FEW SECONDS

This leads us, quite naturally to ask the question: Just who is in charge of policy...who does assume responsibility in case something happens...and just what are the Federal agencies and state agencies involved in this whole thing?

CUT TO CHART OF FEDERAL AGENCIES

NARRATOR

There are...were...five primary agencies involved in regulation and establishment of policy as far as nuclear wastes are concerned.

ONE: The ATOMIC ENERGY COMMISSION (AEC)...an agency which had responsibility for U.S. nuclear activities from 1946 to 1974.

CUT TO VTR SCENE #33

NARRATOR

THE AEC had authority to license privately owned facilities to use nuclear materials. In 1962, the AEC initiated an AGREEMENT STATES PROGRAM which allowed states to make agreements with the Federal government to regulate all low level nuclear activities, including certain low level commercial burial grounds within their boundaries.

CUT TO VTR SCENE #34

NARRATOR

New Mexico became an agreement state in 1974, Texas in \_\_\_\_\_.

But, the AEC retained the power to license commercial operators to dispose of TRU wastes.



CUT BACK TO CHART

NARRATOR

8.19  
In 1974, The Energy Reorganization Act abolished the AEC and brought into being the Nuclear Regulatory Commission (NRC) and the Energy Research and Development Administration (ERDA).

---

20)

COLOR IN NRC

NARRATOR

In 1974, the NRC, an independent board which regulates all U.S. Commercial & nuclear activities was formed. It's an independent board whose members are appointed by the president.



Let Col. Shurtown  
Let Emory and. Cannon -  
Jenac!



(20)

COLOR IN NRC

NARRATOR

In 1974, the NRC, an independent board which regulates all U.S. Commercial nuclear activities was formed. It's an independent board whose members are appointed by the president.

COLOR IN ERDA

NARRATOR

Between 1974 and 1977, the Energy Research and Development Administration was responsible for the nuclear research and development formerly handled by the AEC. This responsibility included weapons production and energy development.

CUT TO VTR SCENE #35

NARRATOR

ERDA and its prime contractors were exempted...with some exceptions...from NRC regulations to preserve national security. In 1977, ERDA was abolished as an independent agency and was absorbed onto the department of energy.

CUT TO CHART OF FEDERAL AGENCIES; COLOR IN DOE

NARRATOR

The Department of Energy was formed in 1977. This agency was given the responsibility for nuclear research and development...this responsibility included the authority to conduct research necessary to policy-making where waste management, actual waste handling and storage of all defense wastes are concerned. This included disposal of commercial high level waste and/or spent fuel elements.

CUT TO VTR SCENE #36; KEY DOE DIVISIONS

NARRATOR

The Department of Energy's Waste Management Office includes a Division of Waste Isolation. This division selects sites; conducts research, development and demonstration work on a permanent repository.



(21)

KEEP VTR SCENE #36; CONTINUE KEYS OF DIVISIONS

NARRATOR

Inside DOE, a Division of Waste Products is in charge of waste handling and processing facilities for all types of civilian and military waste, as well as decommissioning and decontamination work.

The Division of Fuel Storage and Transfer handles both interim storage facilities and availability of transportation systems.

WIPP is the part of the Projects Staff of the Waste Management Office. DOE has authority to regulate its temporary waste storage and treatment activities.

CUT TO CHART OF FEDERAL AGENCIES; COLOR IN EPA

NARRATOR

The final agency responsible for certain aspects of nuclear wastes programs is the Environmental Protection Agency... responsible for providing environmental radiation protection criteria and standards.

CUT TO VTR SCENE #37

NARRATOR

The question of nuclear wastes has become national concern. People are asking what policies should be made and who should make them...and these questions in themselves are becoming just as controversial as the issues involved in the whole area of nuclear wastes themselves.

CUT TO VTR SCENE #38

NARRATOR

To this point, Congress has exercised control over nuclear waste disposal only through appropriations.

In 1978, Congress turned down funding for DOE to license WIPP. This was an attempt to be sure that WIPP would be constructed and operated with strict Congressional approval. At present, however, it's still not sure that a license is needed and the Nuclear Regulatory Commission has yet to set criteria for such licenses.



(22) CUT TO VTR SCENE #39; KEY 1979 & IRG CENTER SCREEN

NARRATOR

When President Carter set the National Energy Plan in motion, he ordered a review of U.S. Nuclear Waste Management. In 1979, The Interagency Review Group on Nuclear Waste Management (the IRG) presented its report to the president.

Today, however, there are still questions and the IRG has made no recommendations for the establishment of an Administrative policy in respect to long-term management of nuclear wastes. Neither have recommendations been made of supporting programs to implement any policy.

CUT TO VTR SCENE #40, SPEAKER PRO IRG "MISMANAGEMENT CHARGES", NARRATOR VO FIRST FEW SECS

NARRATOR

The IRG report says that for the past 30 years, management of radioactive wastes has experienced inadequate management of waste management research and development efforts with those for other parts of the nuclear fuel cycle.

BRING UP AUDIO ON IRG SPEAKER, KEY NAME/TITLE/PART OF COUNTRY 6:00--7:00

CUT TO GRAPHIC QUESTION WHAT IS POLICY/OBJECTIVE ANYWAY?

NARRATOR VO

Perhaps the question should first be asked and answered: just what constitutes a basis for policy? What is the primary objective of waste management planning?

CUT TO VTR SCENE #41; KEY OBJECTIVE: AND DEFINITION

NARRATOR

The primary objective of waste management planning should be to isolate all nuclear wastes from the niosphere and see that they pose no significant threat to public health and safety.

CUT TO VTR SCENE #42

NARRATOR

Further, IRG states that the responsibility for the public health and safety as concerns nuclear wastes... is the responsibility of the present generation. We cannot defer it



BRING NARRATOR VO LAST FEW SECS OF VIDEO

(23)

CUT TO VTR SCENE #43, CROWD SCENE. KEY QUESTION: WHAT PART DOES CITIZEN PLAY, CENTER SCREEN.

NARRATOR

Precisely what is the role of the citizen in decision making on public issues...more specifically in the decision-making as far as the nuclear waste issue?

CUT TO VTR SCENE #44

NARRATOR

The issue of nuclear waste is a highly technical one. And... while it is good when you...the average citizen can become informed on the technicalities involved...you probably don't have the time to delve into the finite points as the scientists do. So... where can you do the most good?

CUT TO VTR SCENE #45

NARRATOR

You can be most effective when you express your concern as citizen. To do that, naturally, you must be as informed as possible on the issue. You must stay aware and current with the steps, procedures and timetable planned for the decision process.

CUT TO GRAPHIC; SWITCH IN POINTS AS THEY ARE NAMED

NARRATOR

How can you best do this? Know which appointed and elected officials have responsibility in the entire process of nuclear waste.

Know when and how to express your views...and the most appropriate person to express them to. Write directly to federal officials involved, since the federal level is where many final decisions will be made.

KILL KEY "POINTS" AND KEY "OFFICES"

NARRATOR

Write to the Executive Office of Science and Technology and The Division of Energy Technology at DOE.

Write to your representative in Congress.



is where many final decisions will be made.

KILL KEY "POINTS" AND KEY "OFFICES"

NARRATOR

Write to the Executive Office of Science and Technology and  
The Division of Energy Technology at DOE.

Write to your representative in Congress.

(25) KILL "OFFICES" AND KEY "POINTS"

Take time to attend hearings, conferences, help attain media  
coverage and write letters to editors.

Be persistent. After all, this is still your country, and you  
have a right to have a say and a voice in what happens...but  
you must realize that things happen slowly...and you must be  
able to hold out for the duration..

FADE SLOWLY INTO END OF YARN AS HANDREACHES IN AND PICKS IT UP.

Once decisions are made, it's not the end of the line for your  
involvement as a citizen.

HANDS BEGIN TO REWIND YARN AS KITTEN REACHES UP AND TRIES TO GRAB STRANDS

You must continue to watch what happens, to monitor policy,  
to take an active part in implementation of public policy.

These things are all as important as the other steps leading to  
decisions. Only through watchfulness can you and other citizens  
assure yourselves that policies

FADE INTO LS WOMAN SITTIN IN ROCKER, CAT ON LAP. SHE IS KNITTING. BEGIN  
SLOW IN AS SHE PUTS DOWN NEEDLES AND END WITH CU OF SWEATER.

NARRATOR

WILL ACHIEVE DESIRED ENDS...that intent and purpose will be  
realized.

BRING MUSIC UP

ROLL CREDITS ACROSS SWEATER TO BEGIN WITH. KEEP CREDITS ROLLING AS QUICK  
CUTS OF PREVIOUS SCENES SHOW ON SCREEN: BOMB, LABORATORIES, SPEAKERS, ETC.  
END FINAL CREDITS OVER KITTEN TANGLED IN BALL OF YARN.



LWV - VTR Project.

Money needs to be spent by Oct. 31.

I. Rough script outline to be mailed out by Oct. 20 -

II. Doc - wants to see finished tape  
Texas Utility Services / Dallas -  
Atomic / Industrial Forum (Marge Watson)

III. Natl LWV has attorney's

IV. 6 audio transcription from Pat Nichol - by Oct. 12

Need

2 - 2 inch  
reels for  
PBS -

B -  $\frac{3}{4}$  file copy  
1. State League  
2. Natl League  
3. My files

Theme of TIME - an issue on both sides -  
perspective of how time influences a decision -

→ stay away from nuclear energy - deal  
only w/ nuclear waste -

1. Don't bring up comparative aspects  
of alternative energy sources  
2. How can we deal w/ nuclear  
waste -

- a). technical
- b). political
- c). social

★ 2. Theme or Hook for the 60:00 documentary  
Neutral concept - something to sit on the fence  
with -

Get people  
to think  
realize that  
there are  
many sides  
to a <sup>solution</sup> ~~problem~~



## Sex Utility Comm.

I. The big picture: why do people litter?

A. Answer would take years. Time is too precious to spend — so —

B. What can we do with litter once we have it.

ACTION: litter, pick-up scenes —

II. Nuclear power as an energy source is the big question  
unresolved / yarn { A. We wait deal with that question  
B. We will deal with: what to do w/ the nuclear waste we now have

ACTION: TIGHT Screen — yarn, pull out for cat/yarn, follow cat as it bats ball of yarn — Roll — key Credits.

S.E. Music — back in TIGHT Screen and SFX yarn into light burst on screen which dies into next scene — (yarn end as time line)

III. How Dangerous is Nuclear Waste and how long do we have to find an answer —

ACTION: Intersperse shots people giving various views w/ —

A. Characteristics

1. Human health

c) Contamination

a) Tox

v). exposure



1st draft - Nov. 1  
2nd draft - Nov. 16

Mail  
Outs

Procl. start - Nov. 19-21-  
(VSI) 26-27-

T.V. station Nov. 29-Dec. 7<sup>th</sup>

Distribution by Dec. 15<sup>th</sup> -



### B. Safety

1. natural disaster
2. human error
3. technical failure

### C. Environment

- a). biosphere
- b) bed values

## IV.

Are we stalling for time

A. What have we got

B. what can we do.

1. isolate waste?

a. generation

1. list

2. com

3. defense

2. Containment?

a. interim storage

b. escape by accident

3. disposal

4. Options

a) form

1. solidification

2. vitrification

b) Host

1. deep geologic burial - salt etc

2. outer space - sun

3. deep ocean trench

4. Arctic icecaps



#### V. Why don't we do something - What part does Govt play -

A. No decision because

1. technology not adv. to inc. soft
2. experts can't agree
3. no energy options / program

B. Govt slow

1. little money invested
2. assumed tech. could handle prob.
3. inter. solution unsatisfactory.

C. Too many cooks spoil soup

D. People mis trust govt -

E. People are more aware of environment

F. Media has shrunk world - news travels faster

#### VI. When will dec. be made

A. Policy forum -

B. Recipe for decision -

1. econ -

a) too expensive to keep

b) " " " scraps

2. Liability - question

3. feasibility

C. Public opinion -

a) apathy

b) over-aggressive



#### D. Politics + Spec Partisan Inst -

1. Industry vs. environmental
2. Reg. ban

#### E. Legis / Reg

1. State rights
2. power base
3. ultimate control

#### F. World Factors -

1. proliferation
2. national security
3. disarmament

#### VII. Summary -

A. Indust. doesn't make policy - Reg follow: + -

B. Can we trust Uncle Sam -

C. Are we indifferent

D. Should you get involved

E. Difference B/tm storage + disposal



For Thursday -

1. finish last 2 sections of script
2. Make copy of ~~script~~ Pat's speech & return  
Original



League of Women Voters Education Fund  
1730 M Street, N.W.  
Washington, D.C. 20036

TEXAS

(state)

PRELIMINARY PROPOSAL FOR A STATE LEAGUE  
ENERGY EDUCATION OUTREACH PROJECT  
(PHASE II)

Date: September 15, 1978

State President: Betty Anderson

League: LWV-Texas

Address & Phone:

Address & Phone: 1212 Guadalupe, #109  
Austin, TX 78701  
(512) 472-1100

1. Workshop Participant (project manager):

Patricia Bruno

Address & Phone:

2. Workshop Participant:

Pat L. Nickell

Address & Phone:

\*\*\*\*\*  
Evaluation of Phase I

1. Briefly, what were the objectives of the first state League energy education project?

The primary objectives of the first energy project were to: (1) hold three energy conferences in various locations in Texas; (2) provide information on both energy production and conservation, though emphasizing conservation -- a need in a producer state such as Texas; (3) reach expected audiences of 50-75 participants at each conference including League members, legislators, and the general public; (4) videotape the Austin conference for distribution to other local League areas.

2. From the state League's point of view, was the project successful in meeting those objectives?

Yes. The project was successful from the point of view of the LWV-Texas in that the conferences were informative and the desired number of individuals were reached. We ~~a. If yes, what aspects contributed significantly to its success?~~

were not as successful in reaching legislators in the first two conferences, however the one held in Austin achieved this goal. This was due to location as well as emphasis on a legislative response panel in Austin. The videotape has been ordered for showing in Amarillo, Corpus Christi, San Marcos, Harlingen, and Abilene. It was shown in Austin initially.

b. If no, why not? What, if anything, do you think should have been done differently or should be done differently in another project?



### Description of Phase II

Describe your overall proposed project, including your plans to make full use of effective materials developed in the first phase and to increase your audience or to target certain groups. (Attach an additional sheet, if necessary.)

The purpose of this project is to produce a 30- or 60-minute video tape documentary in cooperation with KTXI-TV, Lubbock's public television station, in order to ~~regularly~~ examine the questions and controversies surrounding nuclear waste disposal.

This documentary will examine three prongs of the nuclear waste issue: public fears, emerging policy and legislation, and proposed methods and costs of waste disposal/storage.

Program format will include interviews with Carter nuclear policy architects, regional nuclear energy advocates, environmentalists, and area consumer protest groups.

It would also include a brief review of recent proceedings from public hearings conducted in Midland, Amarillo, and El Paso, Texas over proposed nuclear disposal sites.

The documentary will further include an explanation of ~~major~~ risks and safeguards, ~~existing, and proposed~~, for the transportation, storage and disposal of nuclear waste material.

Production will be under the supervision of Production Manager George Warmingham, and the program will air on Channel 5, KTXI in the spring of 1979. Video copies will be made available for use by local Leagues through the state office. Information on the documentary will be available to the West Texas local Leagues in Abilene, El Paso, Amarillo, Midland, and Odessa for local TV promotion. Copies of the tape will be offered to the Public Broadcast Service with its 200+ stations in a national network, a print of the program will also be available to any broadcast station to air on a non-commercial basis, and to educational and cultural institutions within the state.

Timetable Give a brief outline of goals or activities you would plan to accomplish in each time period.

Nov--Dec Begin research; complete interviews in Washington, D.C. and Austin, Texas; begin reviews of public hearings, and finish on-site filming and interviews in Carlsbad, N.C.; initiate project grant publicity.

Jan--Feb Complete interviews in Midland, Amarillo, Albuquerque, and Los Alamos; complete research and hearing reviews; transfer video cassette to two-inch tape; begin editing.

March--April Complete editing and production; finish promotional material for publicity.

May--June Dubbing and distributing four tapes for airing; make material available for air.

Budget Attach a general, proposed project budget

SEND THIS PROPOSAL BY SEPTEMBER 20, 1978 TO THE ENERGY DEPARTMENT, LEAGUE OF WOMEN VOTERS EDUCATION FUND, 1730 N ST., N.W., WASHINGTON, D.C. 20036.





**League of Women Voters of Lubbock**  
**Lubbock, Texas**

October 12, 1978

Bill deTournillon, General Manager  
KLBK-TV Channel 13  
[REDACTED]

Dear Mr. deTournillon:

On behalf of the League of Women Voters, we are delighted that you have accepted our proposal to jointly produce a public affairs program at Channel 13 exploring the problem in Texas of nuclear waste disposal. We are looking forward to working with you and your staff on the project. The League applauds your commitment to voter education and public service.

To confirm our conversation of October 11, KLBK will:

provide editing and technical assistance for the production of a 30 or 60 minute documentary to air in the Spring, 1979;

make available a camera technician and equipment for on-site taping and interviews. Approximately 15 days of out-of-town travel is anticipated within the grant period of six months.

and allow the use of Xerox machines, graphics, and Texas WATS line privileges at the station's convenience.

Budgeted within the \$5500 grant are travel costs, including air fare, food, lodging, and car fare for a KLBK-TV camera technician. To help defray station expenses, approximately 25 per cent is budgeted to KLBK for graphics, tape costs, equipment rental and promotion and publicity.

Enclosed are copies of the grant application stating the extent of the project (see bracketed material) and League of Women Voters Education Fund guidelines with spending limitations.

The League would like to thank you for your receptivity and enthusiasm and we look forward to a rewarding and cordial working relationship.

Sincerely,

Carolyn Lanier, President  
League of Women Voters of Lubbock



[REDACTED]

[REDACTED]

Lubbock, Texas 79413



# BUDGET FOR NUCLEAR WASTE DISPOSAL DOCUMENTARY

<u>STIPENDS</u> for project managers (10%)	\$ 550.00	\$ 550.00
<u>TRAVEL</u> (includes low air fares, food, lodging, and car rental)		
Houston --three days, three people	475.00	
Austin--(2 trips) 3 people, 3 days total includes air fare & mileage @ 17¢ mile	330.00	
Midland--150 miles @ 17¢ mile, one day, three people	50.00	
Amarillo--125 miles @ 17¢ mile, one day, three people	50.00	
Carlsbad, N.M. --three people, two days 215 miles @ 17¢ mile	320.00	
Albuquerque, N.M.--three people, two days, includes air fare at \$174 for all	410.00	
Washington, D.C. # 1 (completed)	110.00	
Washington, D.C. # 2 two people, three days	940.00	
Consultant conference with state energy chair Laura Keever: air fare, Houston/Lubbock/Houston	100.00	2,785.00
<u>OVERHEAD</u> (postage-\$25; Xerox-\$25; phone calls incl, long distance-\$500; and supplies-\$25)	575.00	575.00
<u>PRODUCTION COSTS</u> letter contract with KLBK-TV for 25 % of grant as costs for:		
Graphics	100.00	
Tape costs, editing, dubbing	580.00	
Equipment rental	520.00	
Promotion & publicity	200.00	1,400.00
<u>HANDLING COSTS</u> in State League Office and tape distribution costs	190.00	190.00
TOTAL		\$5,500.00



Project Schedule/Timetable  
LEAGUE OF WOMEN VOTERS OF TEXAS  
NUCLEAR WASTE DISPOSAL PROJECT

Project Description	November	December	January	February	March	April	May	June
RESEARCH & DEVELOPMENT								
-Review of literature								
-Request & collect stock film video clips								
-Arrange raw footage shoots								
-Establish periodic consultant review								
-Script outline and development								
TRAVEL								
-Intvs., consult, public hearings Austin								
-Intvs., conslt., seminars, site video--Houston & Carlsbad								
-Intvs., gen. video, nukes cover-Albuquerque								
-Cover, consult, site video--Midland & Amarillo								
-Intvs.--W.D.C.(tentative)								
PRODUCTION								
-Raw Video, major footage								
-Transfers, working print, re-shoots, first edits								
-Scripting, narration, musical score, graphics production								
-Final edits, master edit,								
-Release print, dubbing								
PROMOTION & DISTRIBUTION								
-News coverage of grant init.								
-Develop promo. channels in Abilene, El Paso, Amarillo, Midland, Odessa, Carlsbad, Clovis, (and all transportation route sites)								
-News coverage of documentary completion and availability								
-Dubbing & distribution of release print								
LEAGUE EDUCATION FUND PROJECT REPORTS								



September 22, 1979

Florence Chichester  
League of Women Voters Education Fund  
1730 M Street, N.W.  
Washington, D. C. 20036

Dear Florence,

I am delighted to report the following development in progress on the nuclear waste documentary.

I have met with Wanda Walser who has agreed to assist in this project as Writer. She has a wealth of background and experience from which to draw and advise. Most recently she had run her own writing and production business, Ideas Unltd.. Wanda is now establishing a department as the first Director of Community Relations at West Texas Hospital in Lubbock. As she and I both work from 8 to 5 she will only be free to devote evenings to writing.

We have established the following deadlines for the project based on projected availability of time and equipment. We feel these are firm dates:

- October 12 - transcripts of raw video completed
- October 20 - finished rough outline-script mailed
- November 1 - finish of first draft script mailed
- November 16 - second script finalized
- November 19 - begin 3/4" rough production
- November 27 - final rough complete, feedback from DOE in
- Sat + Sun* - November 29 - begin TV station production up to 2"
- Dec. 1st 2nd Sunday* - December 7 - target for finished 2" tapes, depending on TV station time available
- 2 p.m. - 6 p.m.*
- 8 a.m.* - December 15 - distribution complete, negotiation with PBS in progress

*Dec. 8 + 9<sup>th</sup> - 2 p.m. - 6 p.m.*  
*8 a.m.*  
I have enclosed a resume to further excite you about Wanda's abilities. The arrangement we have agreed upon will provide a fee of \$1,200. to her for her services. Any production or other expenses must be paid in addition.

As all grant monies must be spent by October 31, I would appreciate receiving the additional \$500. if that is still available, with any directives or restrictions which might apply to its use. I anticipate spending it to secure production time.

Unless there is further need for clarification on any of this, you will hear from me on October 20th, with a rough outline script.

Love,

*Patricia*  
Patricia Bruno



## Synopsis -

The question of nuclear power as an energy source is so complex and so controversial it's like a giant ball of yarn which gives an appearance of being in some sort of order, but which upon unraveling proves to be extremely tangled below the first layer.

One of the strands of this ball of yarn - nuclear energy - is nuclear waste, a subject ~~bec~~ increasingly as complex, as the bigger issue of which it is a part.

It will be our purpose, therefore to present a macro view of this particular subject, then, while avoiding the parent issue of nuclear power as an energy source.

<sup>In our prod.</sup>  
We will examine four general aspects of the question of nuclear waste: The urgency of the issue itself, the use of time in connection w/ nuclear waste, the question of delay in disposal of nuclear wastes, and the factors which determine the comminence of ~~dispo~~ or long range of disposal decisions.

Within each of these four areas we will attempt to provide the general public w/ a clear, layman's terms view of each ~~side of the question~~ specific area within these four larger areas.

A brief, tentative outline to production approach is attached.

Hope to present info in clear -  
concise way.



Questions - what is WIPP - exactly

INTRO - a man (custodian) picking up waste in a park -

A trash truck dumping -

A boy tossing a paper ball over his shoulder into a trash can -

DISS TO:

Child eating candy + throwing wrapper away -

As man progresses - waste is inevitable -

And some of the things which man uses - which produce waste - are debated as to their value - their effectiveness - their good or bad effects -

person taking medicine

Energy - into matter - matter into energy - the very act of living produces waste - so that, in the final analysis - the debate about the factors causing waste - give way to - "What can we do w/ the waste?"

So it is w/ Nuclear Energy - the question investigated here is not Nuclear Energy itself - But - "How <sup>What shall we do about Nuclear waste?</sup> can we best dispose of its waste?"

Because we ask that question, we must ask several others - and it is these that we will investigate in this presentation -

- A. How urgent is the question of NW
- B. How dangerous is NW -



C. What are the Characteristics of NW  
and how do they pertain to your  
health, safety, and environment

see outline to

II. And if we can present insight into these  
areas, then we must ask others -

Are we using our time wisely

Where are we in terms of what we have and

what we can do -

How is NW generated - how is it contained -

Can we isolate NW - and if so, <sup>Can it be contained</sup>

What are the options

Disposal - Terminal Solutions

Pilot Projects -

Form -

Host -

diff  
between  
storage  
& disposal

III. What Part does The govt play - and why have  
no concrete decisions been made on NW -

To answer this question IV - outline to -

Summary - Random Thoughts -



1. freedom.

2.

p. 2 Hist. Perspect. Report DRG March 1979

p. 3. Next to last R.

p. 4 - Budget

p. 5 - semi-pro -

linking  
licensing

I need  
n.p.p.  
cont.

to a  
semi-  
that nuclear  
wastes be  
contained  
continued

a) technology for disposal well in hand

b). But - is the govt doing all it can?

con - hazards of wastes to future gene.

IMPACT OF N. W <sup>Concerns</sup> <sup>Concern</sup>

on future of nuclear power -

1. Prod. N. W. - p. 8

2. Maj. classes of N. W p. 9-10

Public Comment p. 20 -



ISSUE OF NUCLEAR WASTE: VIDEO TAPE PRESENTATION

League of Women Voters, Lubbock, Texas

Submitted: 10/20/79

Patricia Bruno  
Wanda Walser



## SYNOPSIS

The question of nuclear power as an energy source is so complex and so controversial, it's like a giant ball of yarn which gives an appearance of being in some sort of order on the surface, but which, upon unraveling, proves to be extremely tangled.

One of the strands of this ball of yarn--nuclear energy--is nuclear waste, a subject increasingly as complex as the bigger issue of which it is a part. So, how can people judge?

It will be our purpose to present a macro-view of this particular subject, then, while avoiding the parent issue of nuclear energy itself.

In our production, we will examine four general aspects of the question of nuclear waste: the urgency of the issue itself, the use of time in connection with nuclear waste, the question of delay in disposal of nuclear wastes, and the factors which determine the time spans of disposal decisions.

Within each of these four areas, we will attempt to provide the general public with a clear, layman's terms view of each specific area within these larger areas.

A brief, tentative outline to production approach is attached. We hope to present our material in an informative, yet interesting way.



Accept problem & deal w/ it

It doesn't matter ~~WHY~~ - OUTLINE  
it just is - where go from here

Conds

Answer the question -  
in broad terms of  
responsibility  
for govt & it (posing responsibility)  
self respect  
small litter → big litter

Why do people litter?

We can't really say. Different people litter for different reasons and in different ways. What's litter to one person isn't necessarily litter to another. But, this one simple fact...people do litter... has become a significant issue in the past few years because it threatens our ecology, our health, our existence.

Garbage dilute - +11/1978  
contain now

So, we don't answer the question anymore of why people litter. Rather, we turn to a side issue: what do we do with the litter that's here?

Of an even more vital nature is the question of nuclear power as an energy source. It's a question too complex to deal with directly. Rather, we choose to deal with a specific relative of the issue: what about nuclear wastes?

How dangerous is nuclear waste and how long do we have to find some answers to the question? What are the characteristics of nuclear waste in terms of human health and survival because of toxicity, exposure and contamination?

And...if we can do something about nuclear waste...how safe are the solutions we choose? What about natural disasters in connection with nuclear waste? How will we allow for human error...or, can we? And, then there are technical failures. Can we learn to work with technical failures? Can we offer fail safe procedures?

Then, we must ask ourselves what nuclear waste and the solutions to its containment or disposal will do to our environment...land values as well as the air we breathe.

Some people think "we"...the American government and those pro-nuclear... are stalling for time. They ask, "What have we got?" They say, "Tell us what we can do."

There are several possibilities. Isolate wastes. To examine that, we must first examine how nuclear wastes are generated... (history, commercial, defense).

Time theme  
as  
4 aspects: ① historical  
② technical  
③ political  
④ social

Options  
Technical



Can nuclear wastes be contained? If so, how? (interim storage; accidents of escape.) What about disposal of nuclear wastes? (terminal solutions and specific projects.)

Do we have options? <sup>Technical</sup> (solidification; vitrification.)

What are some disposal suggestions? How safe are they? (geologic burial, salt, basalt, turf, granite, shale, outer space, sun, deep ocean trench, melting into arctic ice cap.)

considerations for safety:   
 - containment   
 - multiple barrier   
 - resources for intrusion   
 - nat'l disaster

With so many apparent ideas to choose from and so many learned people offering some apparently feasible ideas, why don't we do something? Why do we continue to dally? Why doesn't the government do something?

Some say the technology isn't advanced enough to insure safety. Others say that's not the question; there are other factors. One of the problems? Not even the experts can agree. And, it's a crisis situation in more ways than one. The country is at the end of her energy options.

The government doesn't do something because the government doesn't work well against deadlines. The issue of nuclear wastes has been a low priority item. Actually very little money has been invested in research...so say some. Others say there's no point in trying to achieve perfection...no point in spending more and more on research. The time to make the decision is now... from data already collected.

credibility   
 safety record

Technology, assumed at one time, to be able to handle the problems, has been weighed in the balance and found lacking. And, interim solutions to nuclear wastes have been found to be unsatisfactory. // still learning

Then, of course, there's the story of too many cooks and only one pot of soup. A "committee" decision...too many voices in the decision-making process...special interest groups, lobbyists and others...have greatly confused the issue.

reactionaries - publicists   
 - environmentalists   
 - no-NUKES   
 - no-growth   
 - solar saviors   
 - pacifists - no wars   
 - PATRIOTS   
 utilities   
 NRC   
 DOE   
 NRC   
 STATES   
 (OIL CO.?)

true by   
 emotionalism   
 - myopic vision

Politics   
 Delay -   
 Yes/No   
 - dismissed   
 Yes/No

Social   
 hidden here

is this possible?



At this point, the citizenry are distrustful of governmental capability in dealing with nuclear wastes. More questions are being asked, less answers are being accepted, particularly in view of the raised environmental consciousness of the people.

And, the very thing we're doing now--communication in an effort to clarify--has, sadly, contributed to the confusion, since in today's world media dissemination and almost instant communications allows scrutiny perhaps before some are ready?

Can we ever expect a decision? If so, when? First we must examine how

policy is formulated (construction, erosion of concept.)

What are the ingredients...the recipe, if you will, for a decision?

Economics: too expensive to keep; too expensive to scrap. How liable are we for

the moneys we spend to find solutions? How feasible are expenditures?

Public opinion is another ingredient. Hearings, presumably held to increase public awareness serve only to muddy already murky waters. Public demonstrations pro, con and in-between on an issue, draw attention to it, but often fail to provide any real basis for public decision making.

Politics, of course, always enters in. Special interest groups present cases for their causes...i.e. industry vs. environmental...sometimes with little apparent concern for the situation as a whole.

Legislation/regulation is an issue on the issue where power bases struggle for ultimate control of a situation, i.e. federal vs. states rights.

Until at last we find that what we think, say and do has global implications. We are no longer speaking of our children, your children, our home, your world, but of mankind as an entity. Will nuclear wastes and what we do or don't do with it affect our defense, our national security?

To summarize: there are no "pat" answers. What we present here can provide no answer. What we can do, what we hope to accomplish is a simple unraveling

Ethics

\$ decision  
= emotionalism  
media manipulation  
myopia  
stereotypes  
Divide/Conquer

Power game  
vs  
Safety game  
dependent  
control  
credibility

Foreign Policy  
Atoms for Peace

INTRO

action

immediate solutions

We provide no answer



OUTLINE

time line / present ~~the~~ <sup>among</sup> opinions → for your weighing against your conclusion  
contribute to decision  
of the facts, a straightening, if you will, of what's involved.

We will present a discussion of all facets of the question of nuclear wastes...so that, in the end, each person viewing the production might have been given some real insight, some tangible evidence on which to draw his own conclusions, and help himself, his country and his world in his own way.

4... scales of justice? video here?

flame of freedom

Why - <sup>RIGHT</sup> your freedom to make informed choice



# hospital week™

© 1979 by the American Hospital Association

✓ GJ  
✓ JP  
— JS  
— WW

## MAHON TESTIMONY STRESSES COST OF MEDICARE CHANGES

In testimony Oct. 22 before the Subcommittee on Health and the Environment of the House Interstate and Foreign Commerce Committee on amendments to the Medicare and Medicaid programs, AHA President Alex McMahon emphasized the cost implications of benefit changes. Recalling providers' cost estimates 15 years ago for the Medicare and Medicaid programs—rejected then as too high by federal actuaries but since proved to be valid—he asked the subcommittee to pay particular attention to the cost implications of the amendments on the hospital field.

He went on to criticize the trend by the Administration and Congress to increase benefits of government programs and then to cut back on appropriations to pay for the services—or to propose controls on the providers of services as a means of holding down government expenditures. He specifically warned that, in considering national health insurance, Congress should not create a program for which it cannot pay.

McMahon summarized the AHA's positions on nearly two dozen Medicare-Medicaid provisions and pointed out that certain amendments to Medicare and Medicaid under consideration by the subcommittee would increase the complexity of those programs and add administrative costs, at a time when the Administration is seeking to reduce payments for hospital services. Saying that hospitals, which have saved approximately \$3 billion to date through the Voluntary Effort, have no "fat pockets" from which such reductions can come, he further warned that increasing benefits while reducing payments would impair hospitals' ability to serve Medicare-Medicaid beneficiaries and result in the transfer of costs to other patients.

The subcommittee was also asked to accept the AHA's recommendations on the "swing-bed" provision—authorizing a simplified method of reimbursement for hospitals alternating the use of beds from acute to long-term care.

hw

## HOSPITAL COST BILL AWAITS ACTION BY RULES COMMITTEE

It was anticipated late last week that there could be House floor action on hospital cost control legislation soon. First, however, the House Rules Committee would have to grant a rule for floor consideration of the Administration's proposal, H.R. 2626, and also decide whether and/or within what limits the bill could be amended on the floor. House Rules Committee Chairman Richard Bolling (D-MO) had indicated that his panel would meet Oct. 30 to make the relevant decisions. By parliamentary procedures, House floor action could follow within 24 hours after the rule is granted, but no schedule has been announced.



In preparation for floor action, a bipartisan group of 19 representatives, headed by Rep. Richard Gephardt (D-MO), introduced on Oct. 18 a substitute measure, the Hospital Cost Containment and Reporting Act of 1979, H.R. 5635. The group's strategy is to offer this bill—strongly supported by the AHA—as a substitute for H.R. 2626 during floor consideration. Among provisions of H.R. 5635 are deletion of mandatory controls and support of voluntary efforts to restrain hospital expenses; creation of a national commission to monitor the Voluntary Effort; and federal support in the form of grants for voluntary or mandatory state hospital cost control programs.

In supporting H.R. 5635, the AHA terms it "a constructive legislative alternative that would assist the health care industry's Voluntary Effort, which is already under way."

hw

#### AMA ORDERED TO STOP IMPOSING PHYSICIAN AD RESTRICTIONS

The Federal Trade Commission (FTC) announced on Oct. 24 that it has ordered the American Medical Association to stop imposing restrictions on advertising, soliciting of patients, and contractual practices by its physician members. However, the decision—which the AMA immediately announced it will appeal—would permit the AMA to formulate "reasonable ethical guidelines" governing deceptive advertising and solicitation of patients vulnerable to undue influence. The latter ruling revised an initial decision late last year by an administrative law judge.

The commission's order also requires the AMA to disaffiliate itself from any state or local medical society that engages in conduct prohibited by the order. Among other AMA actions banned is the characterization of closed-panel or similar health care delivery plans as unethical.

hw

#### NUCLEAR MEDICINE CALLED IMPERILED AFTER CLOSING OF 2 NUCLEAR DUMPS

There exists "an immediate crisis for nuclear medicine" and the thousands of patients who need its services, according to the president of the Society for Nuclear Medicine. Leonard Freeman, M.D., was reacting to the closing of another nuclear waste dump site, leaving only one open in the country. The remaining dump, in North Carolina, will not accept any additional waste, according to reports. This development leaves producers of radioactive waste in the western part of the United States with no disposal facility.

According to the society, radiopharmaceutical manufacturers would have to stop production once their typical 10-day waste storage capacities are used up. Disposal problems also face those hospitals which conduct research using heavy radioactive isotopes. The Nevada governor closed a radioactive waste dump because of alleged mismanagement after the governor of Washington shut down a dump because of safety violations.

hw

#### MAJORITY OF STATE'S HOSPITALS LOST MONEY LAST YEAR, SURVEY SHOWS

Three out of four New York State hospitals operated at a financial loss last year, which the Hospital Association of New York State (HANYS) blamed on "the most repressive rate control system in the country." In its eighth annual Fiscal Pressures Survey, released Oct. 23, HANYS reports that 189 of 246 voluntary not-for-profit and public hospitals suffered operating losses averaging more than \$1.3 million apiece in 1978. The average loss was 13.6 percent higher than in 1977. The survey shows that only 4 percent of the state's hospitals avoided an operating loss in the past five years.

George Allen, HANYS president, said the survey indicates that other hospitals are approaching the crisis now faced by the Jewish Hospital and Medical Center of Brooklyn, which is in danger of closing because of losses.

(Continued on fourth page)



Maclean  
Mackin



Our country has a problem. What do we do with nuclear waste?

The question is both complex and controversial. It's like a giant ball of yarn which gives the appearance of being in a kind of order, but which upon unraveling, proves to be a tangled snare (kitty caught in it?)

While nuclear wastes are the ~~direct~~ product of <sup>our atomic</sup> a nuclear age, we <sup>But</sup> ~~will not take~~ the luxury (here) of arguing the merits of nuclear power. <sup>here</sup>  
<sup>(can no longer afford)</sup>  
<sup>The (cannot)</sup> that age has long since dawned, and left us a legacy of 40 years of waste.  
<sup>the era of</sup> nuclear energy survives or dies  
Whether ~~the atomic age~~ stays or goes ~~xxxxxxxxxxxx~~ the wastes <sup>we already live with</sup> will live on for thousands of years. Will it live with us or we with it?  
without us?  
Will we run its life or will it run ours?  
or something

As the single strand which weaves this tangled ball begins to unravel, it exposes a string of related issues. We will take a macro-view of the nuclear waste subject by examining four main aspects of the question:



(20)

COLOR IN NRC

NARRATOR

In 1974, the NRC, an independent board which regulates all U.S. Commercial nuclear activities was formed. It's an independent board whose members are appointed by the president.

COLOR IN ERDA

NARRATOR

Between 1974 and 1977, the Energy Research and Development Administration was responsible for the nuclear research and development formerly handled by the AEC. This responsibility included weapons production and energy development.

CUT TO VTR SCENE #35

NARRATOR

ERDA and its prime contractors were exempted...with some exceptions...from NRC regulations to preserve national security. In 1977, ERDA was abolished as an independent agency and was absorbed onto the department of energy.

CUT TO CHART OF FEDERAL AGENCIES; COLOR IN DOE

NARRATOR

The Department of Energy was formed in 1977. This agency was given the responsibility for nuclear research and development...this responsibility included the authority to conduct research necessary to policy-making where waste management, actual waste handling and storage of all defense wastes are concerned. This included disposal of commercial high level waste and/or spent fuel elements.

CUT TO VTR SCENE #36; KEY DOE DIVISIONS

NARRATOR

The Department of Energy's Waste Management Office includes a Division of Waste Isolation. This division selects sites;



NARRATOR

We could take much more time to examine the miracles of nuclear discover, but we must limit ourselves. Let's talk about some terms you've probably been hearing.

DISS. TO VTR SCENE #3 (people working in labs or working w/uranium and radium in some way) KEY TERMS CENTER SCREEN AS THEY ARE USED.

NARRATOR

Let's talk about ALPHA PARTICLES.

Alpha particles are properties of many of the heaviest nuclear species... like uranium and radium. These particles are really "rays". They are easily absorbed into ordinary paper.

Alpha particles are relatively harmless because they lose their energy through a process known as "~~ionization~~ ionization", a stripping of electrons from surrounding atoms.

BETA RAYS, or beta radiation, is another form of radiation emitted by radioactive substances. They are more penetrating than Alpha rays. Beta rays can be absorbed by simple sheets of aluminum.

GAMMA RAYS or gamma radiation...are extremely penetrating rays which are really the same thing as X-Rays.

DISS TO VTR SCENE #4 (Bomb at Los Alamos)

NARRATOR

Even though radiation and nuclear wastes have been around for early thousands of years, even though ~~discovery~~ discoveries brought many things to light, the world got its first real look at things nuclear in December 1942...when the first nuclear power plants "sprang" up almost overnight.



(20)

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PROJECT SUMMARY REPORT  
on  
Nuclear Waste Documentary  
for  
ENERGY EDUCATION PROJECT, PHASE II

League of Women Voters of Texas

OCTOBER 22, 1979

The Texas Energy Project Documentary on Nuclear Waste Disposal is in its final phase of production.

The Research and Development and Programming phases continued through April of 1979. During these months we obtained videotape and interviews in Albuquerque, Austin (twice), Denver, Dallas, Carlsbad and Lubbock with scientists, DOE officials, legislators in Texas and New Mexico, researchers, journalists, utilities, local officials, and private citizens with views reflecting a wide diversity of facts and opinions on the issue of nuclear waste. The exposure and the materials collected now represent an impressive library of resource material, clippings, reports and publications.

We now have approximately 20 commercial quality "raw" tapes, several clips from national and local news footage, a news report series, slides, photographs, DOE public affairs videotape and a PBS McNeil-Leher Report. In addition, through the assistance of the Atomic Industrial Forum and the Texas Utilities ~~Company~~ <sup>Services, Inc.</sup> and the DOE regional Dallas office, we have about ten 16mm films on loan--including "Project Salt Vault" about Lyons, Kansas, and a European film on simulated deep geologic disposal. We have test footage on transportation casks from Sandia Labs. Additionally we shot our own "cover" film of the research, handling and burial of wastes at Los Alamos.

With this wealth of information and video the project evolved to the scripting stage by April. At that time we met with Marge Wassom, AIF and Frank Shants, TUG to compare the scope of our knowledge and to determine any remaining resource needs. We also had meetings with Laura Kever, at that time LWV-T Energy Chair, and member of the Texas Energy Advisory Committee, now as Chair of the Nuclear Energy Committee for the State. We also met with other interested local state leaguers, particularly June Naylor of Midland-Odessa.

After developing seven script outlines and four unsuccessful script starts, the project momentum was interrupted by a series of unrelated events.

The Three Mile Island accident suddenly gripped public and governmental attention leaving future sentiments uncertain. This was initially seen as a disadvantage to our purposes because of the potential for attitudinal changes all over the spectrum. However, both Pat Nickell and I got sidetracked with personal commitments at about that same time. This provided some time for an equilibrium to reestablish. And Pat began the process of buying, selling and moving her household while I accepted and adjusted to full time employment. In addition, about this time our camera technician, Victor Palit, of KLBK-TV, left the station and project having accepted employment with another TV station in Kansas City. Needless to say, the project went on 'hold' for over 3 months, with the exception of continued reading and keeping current on events as they affected waste isolation.

Pat Nickell did attend the Wyoming LWV-Wy Uranium Mining and Milling Conference in Laramie from June 12 to 16.



On June 9 a public hearing was conducted by the DOE in Carlsbad, New Mexico on the WIPP Draft Environmental Impact Statement. We were able to rent equipment and a cameraman from the local ABC affiliate, KMCC-TV, to attend this meeting and take footage. Here we were able to interview Carlsbad's Mayor Gerrels and other business interests, citizen objectors and supporters, as well as anti WIPP demonstrators, including Roxanne Kirschner, a resident and SWRIC spokesman.

During these same months KLBK-TV, our production partner, underwent FCC re-licensing and sale which resulted in changes in personnel and policy. This created difficulties for us in getting available equipment, staff and production time. I met with Bill Blan, Production Manager, and we discussed our needs. As a result we now have an informal understanding with Channel 13 that encourages us to use whatever more convenient production facilities we can arrange with the \$300. balance of funds committed to KLBK initially.

At one point during the summer I had arranged for later use of the Texas Tech University, Mass Communications Department facilities for editing and pre-production at \$12 per hour. This was later foiled by new department access regulations.

By September it was clear we would need further help to complete the project. So we began a search for a writer with tv production experience.

Meanwhile, on September 7, Pat Nickell attended in Lubbock a Texas Energy Advisory Council's Nuclear Energy Committee hearing on a generic environmental impact statement and state waste management policies. This was poorly attended by the community and netted no new information or material for us. Many Leaguers did attend, including Catherine Perrine, State Natural Resources Chair (?) and June Naylor of LWV-Midland-Odessa. She spoke and presented maps challenging the WIPP based on concerns for the integrity of the Santa Rosa underground water supply against possible contamination. We are checking her information and materials for validity.

By the end of September we had found Wanda Walser, an experienced, published and creative local writer with her own free lance production business. She is also employed as Director and is establishing a public relations department for a local hospital. Wanda has agreed to work with us to project completion as a writer, production consultant, and generally however needed. Our agreement provides her approximately \$250 for equipment and other expenses and a \$1200. fee. This exhausts the balance of grant funds.

We have established the following production schedule with firm hopes of completing the documentary by December 15.

- October 20 - Synopsis and new script outline. Completed and sent to LWV-US Ed Fund
- November 1 - First script draft completed for review and comment by LWV-US/EF and several other individuals whom we have interviewed or contacted as resources. These should include Dallas Regional DOE, and Albuquerque DOE, Atomic Industrial Forum, Texas Utilities Company, Southwest Regional Lab--anti WIPP citizen's group in Albuquerque, Tom Cochran, Terry Lash, Laura Keever, and New Mexico's Leaguer Marianne Thayler, author of the NM Nuclear Waste monogram.
- November 16 - Second script draft complete, revised.



November 19 - 27

Begin 3/4" editing and rough production for final clean-up.

November 29 - Dec. 7

Production clean-up, special effects, audio clean up, and dub to two inch tape for commercial broadcast quality distribution, and 3/4" dubbing for distribution.

December 15- All tapes sent to key points: LWV-US, LWV-Texas and DOE; notices of availability and appreciation also sent.

Arrangements have been made since September with KMCC-TV (ABC affiliate) for production time during the weeks of November 29 through December 7. This is a time of heavy Christmas commercial production load for the station and we are fortunate to have time reserved. The time and use of equipment will be no charge to us as a public affairs service.

I am currently arranging first edit and pre-production time and facilities with a local video distribution company who has an editing showroom and rental equipment. This will require some additional funds which the League has offered to provide.

Several groups and individuals have already expressed a desire to purchase copies of the documentary, including Batelle N.W., Texas Utilities Company, Services, Inc., the Atomic Industrial Forum, and OTA/NRC's Dr. Leachman--if he's still there. We will attempt to send letters announcing its completion and availability through the State or National League and DOE if this is confirmed. We will verify whether the documentary must be rented, may be loaned or can be purchased for the price of taping and dubbing.

All Texas and New Mexico LWV's will also be advised.

We have repeatedly talked with PBS affiliates in Lubbock, Dallas, and Austin who suggest we present a final print for possible broadcast regionally if not at least locally when the project is completed. This we will do. It will represent our final distribution effort. Copies and a two inch original tape will become the property of the appropriate source at this point. One copy will remain in the possession of the Lubbock League of Women Voters as appropriate.



this leads us, quite naturally to ask the question: Just who is in charge of policy...who does assume responsibility in case something happens...and just what are the Federal agencies and state agencies involved in this whole thing?

CUT TO CHART OF FEDERAL AGENCIES

NARRATOR

There are...were...five primary agencies involved in regulation and establishment of policy as far as nuclear wastes are concerned.

ONE: The ATOMIC ENERGY COMMISSION (AEC)...an agency which had responsibility for u.S. nuclear activities from 1946 to 1974.

CUT TO VTR SCENE #33

NARRATOR

THE AEC had authority to license privately owned facilities to use nuclear materials. In 1962, the AEC initiated an AGREEMENT STATES PROGRAM which allowed states to make agreements with the Federal government to regulate all low level nuclear activities, including certain low level commercial burial grounds within their boundaries.

CUT TO VTR SCENE #34

NARRATOR

New Mexico became an agreement state in 1974, Texas in \_\_\_\_\_. But, the AEC retained the power to license commercial operators to dispose of TRU wastes.

CUT BACK TO CHART

NARRATOR

In 1974, The Energy Reorganization Act abolished the AEC and brought into being the Nuclear Regulatory Commission (NRC) and the Energy Research and Development Administration (ERDA).

COLOR IN NRC

NARRATOR

In 1974, the NRC, an independent board which regulates all U.S. Commercial nuclear activities was formed. It's an independent board whose members are appointed by the president.



NARRATOR

These tests..specified in the DOT and NRC regulations...include a high-speed impact test, a puncture test and a fire test. A water immersion test is also required. Container size..its adequacy concerning capacity and its ability to meet accident conditions and other scientific test criteria...is studied.

CUT TO VTR SCENE # 28

NARRATOR

What about insurance? What happens in a real-life accident situation? Is there some way to recoup damage or at least offer recompense to those involved?

CUT TO VTR SCENE #29

NARRATOR

No insurance policies written in the United States cover nuclear accidents. BUT...in 1957, the Price-Anderson Act was passed. This legislation authorizes The Department of Energy (DOE ) and The Nuclear Regulator Commission (NRC) to enter into indemnity agreements with contractors and licensee operating nuclear & facilities.

CUT TO VTR SCENE #30

NARRATOR

Through these particular agreements, the insurance industry provides up to 560 million per nuclear accident. DOE officials have said that financial ~~xxx~~ liability for WIPP related nuclear accidents involving radiation contamination, both operation and transportation related, would be assumed by the Federal Government under the Price-Anderson Act.

CUT TO VTR SCENE #31

(19)

NARRATOR

However...just how much these agreements, according to the Price-Anderson Act...will x cover have not yet been established by the agencies involved, and their specific action will be required to set such policy. Critics have raised legal questions on the issues of liability, exemptions and coverage, stating that problems are not as easily resolved as DOE indicates.

CUT TO VTR SCENE #32 (KEY NAME/TITLE/AREA OF PERSON) 5:00-6:00 ~~XXXX~~ WARNING

NARRATOR VO LAST FEW SECONDS



of heat. They probably will be solidified and shipped as inert, immobile material which is nonexplosive, noncombustible and which cannot become gaseous or airborne.

CUT TO VTR SCENE #24 (REGULATION)

NARRATOR

There is, of course, regulation concerning the transportation of all hazardous materials, including nuclear wastes. The regulation begins with D.O.T....the Department of Transportation. Next, the Nuclear Regulatory Commission reviews commercial packaging designs to verify their adequacy.

CUT TO VTR SCENE #25

NARRATOR

As a matter of fact...to this point in time...highly radioactive wastes/have NOT been transported from points of origin to repositories. But, it's a matter of routine to ship unprocessed spent fuel.

CUT TO VTR SCENE #26 (LABORATORIES)

NARRATOR

Sandia Laboratories in Albuquerque, New Mexico is currently studying packaging for these wastes and designs are in the offing in preparation for permanent disposal at selected sites.

CUT TO VTR SCENE #27

NARRATOR

In order to be approved by NRC, however, these designs must first withstand several "torture" tests which produce damage conditions similar to what a package might actually encounter in a hypothetical severe transportation accident.



NARRATOR

If WIPP goes in to full operation, it's expected to receive:  
37 truck loads and 28 rail cars of TRU wastes per week.  
Also: one truck load per wee and seven rail cars per year  
of high level wastes

CUT TO GRAPHICS DEPECTING INTERNATIONAL REGULATIONS

NARRATOR

What is a good way to package and transport the wastes?  
Under U.S. and international regulations, low level wastes  
require only normal industrial packaging for shipment...  
they do not require special rail cars or other transport vehicles.

CUT TO GRAPH SHOWING TRU WASTE LEVEL PENETRATION

NARRATOR

TRU wastes don't require heavy shielding. They have very  
low levels of penetrating gamma radiation. BUT...TRU wastes  
do require ACCIDENT PACKAGING...because of thêir long life  
and the biological toxicity of plutonium and its potential  
contamination of people or objects when it's released from  
its packaging.

(17) CUT TO GRAPH SHOWING HOW TRU WASTES WILL BE CONTAINED IN TRANSPORTATION

NARRATOR

To transport TR wastes...extreme containment will be stressed  
and several containment barriers will be provided in the packaging  
system. Transuranic wastes will be shipped either in a large  
"accident proof" box or in a bundle of 55-gallon drums, each  
ENCASED IN some kind of outer covering or protective container  
to protect TRU materials from impact and fire.

CUT TO GRAPHICS DEPECTING HLW

NARRATOR

High level wastes must be heavily shielded during transportation  
because of their radiation levels which produce a great deal



NARRATOR

There are two other unusual geologic conditions in the area...the presence of breccia pipes and anticlines.

KEY IN ARROW POINTING OUT BRECCIA PIPES.

NARRATOR

Breccia pipes are vertical underground columns of broken rock that is more permeable to water than is surrounding rock.

MOVE ARROW TO POINT OUT ANTICLINES

NARRATOR

An anticline is a very large mound of underground rock formed by intense pressure against rock strata. Anticlines in the Delaware Basin may contain gas and/or brine. Special precautions are being taken to assure a site a distance away from the presence of anticlines and breccia.

DISS. TO THIRD GRAPH SHOWING PRESENCE OF WIPP/GEOLOGIC PHENOMENA

NARRATOR

The closest known anticline is three miles from the WIPP site. Holes once drilled in explorations for gas, oil, potash and other fuels are now being plugged carefully to assure they won't become conduits for water which would serve as a transport for radioactive elements into the biosphere.

CUT TO VTR SCENE #19 (NARRATOR VO)

NARRATOR VO

Throughout Texas and New Mexico...where ever potential disposal sites have been publicized, questions have been raised. Citizens are concerned about several things.

(15) DISS. TO GRAPH SHOWING OTHER NATURAL RESOURCES

One: What about the natural resources which lie below the earth's surface....for instance...in the case of the WIPP: Commercial natural/<sup>gas</sup> and oil deposits, which lie below the salt formation...and the potash deposits which lie above?

CUT TO VTR SCENE #20



NARRATOR VO

What frightens so many people is this: they are afraid that a project such as WIPP might be implemented on a pilot basis and later be expanded to a full scale nuclear waste repository...with out enough input from the citizens of the particular area. This, in turn has led to the asking of other questions:

KEY ISSUES OVER SCREEN AS THEY ARE MENTIONED. KEEP SCENE #20

NARRATOR VO

What about retrievability of deposited nuclear wastes in case they are needed or should be moved?

What about accidents from nuclear wastes deposits?

What about flooding both above and below ground?

What about heat stress, gas venting, humidity and extremely long-term isolation of nuclear wastes.

Here's what one citizen had to say:

CUT TO VTR SCENE #21 (KEY NAME/TITLE/AREA) ASSURANCE 5:00--6:00

NARRATOR VO LAST FEW SECONDS

There are others who feel that the risks are too great:

(16) CUT TO VTR SCENE #22 (KEY NAME/TITLE/AREA) WARNING 5:00-6:00

NARRATOR VO LAST FEW SECONDS

One of the big issues concerning nuclear waste is that of transportation...from point of origin to repository. Many people are frightened of what could occur between these two points.

CUT TO VTR SCENE #23 (TRANSPORTATION)

NARRATOR VO

For instance...if WIPP becomes operative, New Mexico highways will see an increased number of vehicles carrying radioactive wastes. So will the railways. Here are the estimates according to a 1978 Sandia Laboratories estimate:

CUT TO GRAPH DEPICTING LOADS RECEIVED AT WIPP



KILL "OFFICES" AND KEY "POINTS"

Take time to attend hearings, conferences, help attain media coverage and write letters to editors.

Be persistent. After all, this is still your country, and you have a right to have a say and a voice in what happens...but you must realize that things happen slowly...and you must be able to hold out for the duration..

FADE SLOWLY INTO END OF YARN AS HANDREACHES IN AND PICKS IT UP.

Once decisions are made, it's not the end of the line for your involvement as a citizen.

HANDS BEGIN TO REWIND YARN AS KITTEN REACHES UP AND TRIES TO GRAB STRANDS

You must continue to watch what happens, to monitor policy, to take an active part in implementation of public policy.

These things are all as important as the other steps leading to decisions. Only through watchfulness can you and other citizens assure yourselves that policies

FADE INTO LS WOMAN SITTING IN ROCKER, CAT ON LAP. SHE IS KNITTING. BEGIN SLOW IN AS SHE PUTS DOWN NEEDLES AND END WITH CU OF SWEATER.

NARRATOR

WILL ACHIEVE DESIRED ENDS...that intent and purpose will be realized.

BRING MUSIC UP

ROLL CREDITS ACROSS SWEATER TO BEGIN WITH. KEEP CREDITS ROLLING AS QUICK CUTS OF PREVIOUS SCENES SHOW ON SCREEN: BOMB, LABORATORIES, SPEAKERS, ETC. END FINAL CREDITS OVER KITTEN TANGLED IN BALL OF YARN.



CUT TO SPEAKER STATE THIS, KEY NAME/TITLE/LOCATION 5:00--6:00

BRING NARRATOR VO LAST FEW SECS OF VIDEO

(23) CUT TO VTR SCENE #43, CROWD SCENE. KEY QUESTION: WHAT PART DOES CITIZEN PLAY, CENTER SCREEN.

NARRATOR

Precisely what is the role of the citizen in decision making on public issues...more specifically in the decision-making as far as the nuclear waste issue?

CUT TO VTR SCENE #44

NARRATOR

The issue of nuclear waste is a highly technical one. And... while it is good when you...the average citizen can become informed on the technicalities involved...you probably don't have the time to delve into the finite points as the scientists do. So... where can you do the most good?

CUT TO VTR SCENE #45

NARRATOR

You can be most effective when you express your concern as citizen. To do that, naturally, you must be as informed as possible on the issue. You must stay aware and current with the steps, procedures and timetable planned for the decision process.

CUT TO GRAPHIC; SWITCH IN POINTS AS THEY ARE NAMED

NARRATOR

How can you best do this? Know which appointed and elected officials have responsibility in the entire process of nuclear waste.

Know when and how to express your views...and the most appropriate person to express them to. Write directly to federal officials involved, since the federal level is where many final decisions will be made.

KILL KEY "POINTS" AND KEY "OFFICES"

NARRATOR

Write to the Executive Office of Science and Technology and The Division of Energy Technology at DOE.

Write to your representative in Congress.



(21) KEEP VTR SCENE #36; CONTINUE KEYS OF DIVISIONS

NARRATOR

Inside DOE, a Division of Waste Products is in charge of waste handling and processing facilities for all types of civilian and military waste, as well as decommissioning and decontamination work.

The Division of Fuel Storage and Transfer handles both interim storage facilities and availability of transportation systems.

WIPP is the part of the Projects Staff of the Waste Management Office. DOE has authority to regulate its temporary waste storage and treatment activities.

CUT TO CHART OF FEDERAL AGENCIES; COLOR IN EPA

NARRATOR

The final agency responsible for certain aspects of nuclear wastes programs is the Environmental Protection Agency... responsible for providing environmental radiation protection criteria and standards.

CUT TO VTR SCENE #37

NARRATOR

The question of nuclear wastes has become national concern. People are asking what policies should be made and who should make them...and these questions in themselves are becoming just as controversial as the issues involved in the whole area of nuclear wastes themselves.

CUT TO VTR SCENE #38

NARRATOR

To this point, Congress has exercised control over nuclear waste disposal only through appropriations.

In 1978, Congress turned down funding for DOE to license WIPP. This was an attempt to be sure that WIPP would be constructed and operated with strict Congressional approval. At present, however, it's still not sure that a license is needed and the Nuclear Regulatory Commission has yet to set criteria for such licenses.



(22)

CUT TO VTR SCENE #39; KEY 1979 & IRG CENTER SCREEN

NARRATOR

When President Carter set the National Energy Plan in motion, he ordered a review of U.S. Nuclear Waste Management. In 1979, The Interagency Review Group on Nuclear Waste Management (the IRG) presented its report to the president.

Today, however, there are still questions and the IRG has made no recommendations for the establishment of an Administrative policy in respect to long-term management of nuclear wastes. Neither have recommendations been made of supporting programs to implement any policy.

CUT TO VTR SCENE #40, SPEAKER PRO IRG "MISMANAGEMENT CHARGES", NARRATOR VO FIRST FEW SECS

NARRATOR

The IRG report says that for the past 30 years, management of radioactive wastes has experienced inadequate management of waste management research and development efforts with those for other parts of the nuclear fuel cycle.

BRING UP AUDIO ON IRG SPEAKER, KEY NAME/TITLE/PART OF COUNTRY 6:00--7:00

CUT TO GRAPHIC QUESTION WHAT IS POLICY/OBJECTIVE ANYWAY?

NARRATOR VO

Perhaps the question should first be asked and answered: just what constitutes a basis for policy? What is the primary objective of waste management planning?

CUT TO VTR SCENE #41; KEY OBJECTIVE: AND DEFINITION

NARRATOR

The primary objective of waste management planning should be to isolate all nuclear wastes from the niosphere and see that they pose no significant threat to public health and safety.

CUT TO VTR SCENE #42

NARRATOR

Further, IRG states that the responsibility for the public health and safety as concerns nuclear wastes...is the responsibility of the present generation. We cannot defer it to future generations.



CUT TO SPEAKER STATE THIS, KEY NAME/TITLE/LOCATION 5:00--6:00

BRING NARRATOR VO LAST FEW SECS OF VIDEO

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## KEY TO VIDEO TERMS

LS--Long Shot

MLS--Medium Long Shot

MS--Medium Shot

KEY--a type of superimposition of one picture or graphics over another picture

VTR--Video Tape Recording

VO--Voice over video...the announcer is not seen on camera

OC--On Camera, usually used when the announcer or narrator appears on the screen

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NOTE: On this script where VTR Scenes are called for and speaker's are specified, we will plug in those particular people to be used and put their actual quotes into the audio portion of the script.

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NARRATOR

We will now discuss some of the measures taken to contain or dispose of nuclear wastes. As we discuss these possibilities, we'll be hearing from people around the country with varying opinions on these questions within the question.

VTR SCENE #10....STORAGE FACILITIES

NARRATOR

Presently most liquid nuclear wastes are stored in above ground tanks, and most solid wastes is buried in shallow trenches.

CUT TO GRAPHIC, CUT-AWAY OF STORAGE TANK

NARRATOR

The liquid wastes are highly acidic. Most of them are neutralized by the addition of sodium hydroxide. This doubles the volume of the liquid waste.

ON GRAPHIC, ANIMATION OF SEEPAGE FROM TANK

NARRATOR

Between 1958 and 1974, at Hanford...18 of the original 149 carbon steel tanks leaked. This released nearly half a million gallons of High Level waste into the soil. Officials there claim the wastes have remained above the water table.

At Savannah River, the tanks are composed of double walled steel liners set in four foot thick cement shells. They have had one leak. This resulted in the release of 100 gallons of high level waste into the ground.

What do experts have to say about this?

VTR SCENE #11.... SPEAKER.... REASSURANCE, APPX. 3:00--5:00 ; KEEP VTR SCENE, BRING IN NARRATOR VO

NARRATOR

There are differing opinions. \_\_\_\_\_ of  
\_\_\_\_\_ says....

VTR SCENE #12....SPEAKER...WARNING, APPX. 3:00--5:00.



(6)

VTR SCENE #5 (ATOMIC POWER PLANT Pantex?)

NARRATOR

These first power plants nursed huge atomic piles inside lead-shielded walls. Inside these units, plutonium was created as the basis of materials for the bomb that was to come.

VTR SCENE #6 (50's & 60's)

NARRATOR

Since that December, nuclear power and resulting wastes have been constant sources of news and controversy. Today, we're bombarded with the pros, cons and in-between of the issue.. and the question is: WHAT TO DO ABOUT THE WASTES? The power itself is already here. This brings us out of the historical portion of the program and in to the second sphere: the technical aspects of nuclear wastes.

VTR SCENE #7, KEY TERMS AS THEY ARE DISCUSSED.

NARRATOR

We experience nuclear waste from two primary sources.  
ONE: DEFENSE WASTES. Defense wastes are those resulting from defense programs and research and development and related activities of the Department of Energy.

These wastes include: Low level wastes, high level wastes and transuranium wastes. Categories of nuclear waste are determined by "nanocuries"...37 disintegrations per second of radioactive elements. Remember that one curie equals one unit of radioactivity.

FOR THE FOLLOWING NARRATIVE SEQUENCES, GRAPHICS WILL BE USED.

NARRATOR

Transuranium wastes are those containing elements with atomic numbers higher than uranium. They are primarily Alpha radiation, and can be contact handled.

High Level wastes are those extracted from irradiated fuel during reprocessing. These are high intensity, penetrating and of long-lived radioactivity. These must be handled by a remote device.

Low level wastes are all other wastes than Transuranium and High Level, some Intermediate wastes as of yet have no official definition, but require/shielding



NARRATOR

The second source of nuclear wastes is COMMERCIAL WASTE. These wastes are Spent fuel elements, Low Level Wastes, High Level Wastes and Transuranium wastes.

Spent fuel elements...the uranium rods used in powering nuclear plants, once used become themselves, a form of nuclear waste and must be dealt with accordingly.

DISS TO GRAPHIC: Diagram of fuel cycle.

NARRATOR

How are nuclear wastes generated? Look at this diagram.

The cycle begins with the mining of uranium. One ton of mined ore yields about two to three pounds of usable uranium which must be extracted in a milling process.

The extracted uranium is called yellow cake. The yellowcake is shipped to a plant and converted into uranium hexafluoride..  $UF_6$ , a solid.

Once heated,  $UF_6$  becomes a gas and allows the concentration of U-235, the uranium isotope that is needed for reactor fuel.

Next, the enrichment process increases the proportion of U-235 in the  $UF_6$ . During fabrication, the enriched  $UF_6$  gas is converted to solid uranium dioxide and formed into pellets. These pellets are placed in zircalloy rods, and this is then known as a fuel rod.

The fuel rods are shipped to reactor sites and there combined with control rods to form a fuel assembly. Multiple of these assemblies form the reactor core. There the fissioning atoms sustain a chain reaction. When this energy is harnessed, it's possible to produce electricity and to power nuclear ships.

After one or two years' use, enough fissions have formed in the rods that a sustained chain reaction is inhibited, and the spent fuel rod is removed and placed under water with other spent fuel rods. These are known as storage pools.



(8)

At the present time, in the United States, the commercial fuel cycle stops. The next step in the fuel cycle is reprocessing which yields plutonium, a major component for nuclear weapons.

In 1977, President Carter established a policy which prohibits commercial reprocessing of spent fuel rods. The purpose...to prevent the possibility that plutonium might be acquired by the wrong groups and made into weapons.

The U.S. Defense establishment and some foreign countries do continue the fuel cycle by reprocessing. They want to salvage still usable materials...primarily plutonium and uranium.

After reprocessing, the uranium again enters the fuel cycle at the conversion plant.

The plutonium becomes weapons, power sources and is used in the space program. Anything left after uranium and plutonium are considered wastes.

DISS. TO MAP, USE SFX TO POINT OUT EACH LOCATION ON MAP, AS IT IS TALKED ABOUT.

NARRATOR

At present, COMMERCIAL low level wastes are buried in six places: Barnwell, South Carolina; Beatty, Nevada; Washington; Maxey Flats, Kentucky; Sheffield, Illinois, and West Valley, New York.

DISS. TO TITLE: DEFENSE LOW LEVEL WASTES

NARRATOR

DEFENSE LOW LEVEL WASTES are much greater in volume and are buried in five major places and several minor sites:

CUT TO MAP ONCE AGAIN; SFX EACH SITE AS IT IS MENTIONED

NARRATOR

The major sites are: Hanford, Washington; Idaho Falls, Idaho; Los Alamos, New Mexico; Oak Ridge, Tennessee; Savannah River, South Carolina



(9) CUT TO: Nuclear waste graph, roll in colors to represent per centages as they are mentioned.

NARRATOR

Of the current nuclear waste volume, LIQUIDS make up about 40 per cent. Salt cake, sludge and spent fuel rods represent almost all the remainder. Currently, spent fuel rods are...as was mentioned before...submerged in pools of water at reactor sites. This is considered a temporary measure. When a final decision is reached as to disposal, the spent rods will either be disposed of as waste or reprocessed.

CUT TO NUCLEAR FAMILY TREE GRAPH TO DESCRIBE THE FOLLOWING:

NARRATOR

Uranium mine and mill tailings, although not considered wastes are of concern in the nuclear waste issue, because they ~~these~~ contain low concentrations of naturally occurring radioactive materials.

DISS. TO MINE SCENE #9

NARRATOR

The tailings are generated in large quantities. These are presently stored on site at mining and milling operations. Here's why they are of such concern:

CUT BACK TO FAMILY TREE, USE CU'S to emphasize each property mentioned.

NARRATOR

Mill Tailings contain Radon and Radium, two radioactive elements of environmental concern. Radon is a noble gas that escapes easily into the atmosphere. Radium, the parent of radon, is a potential pollutant of surface groundwater.

Thorium 230 is the parent of Radium. The half life of these daughters is 80,000 years. Half life is the amount of time it takes for the isotope to lose exactly half its radioactivity.



NARRATOR

We could take much more time to examine the miracles of nuclear discover, but we must limit ourselves. Let's talk about some terms you've probably been hearing.

DISS. TO VTR SCENE #3 (people working in labs or working w/uranium and radium in some way) KEY TERMS CENTER SCREEN AS THEY ARE USED.

NARRATOR

Let's talk about ALPHA PARTICLES.

Alpha particles are properties of many of the heaviest nuclear species... like uranium and radium. These particles are really "rays". They are easily absorbed into ordinary paper.

Alpha particles are relatively harmless because they lose their energy through a process known as "~~ionization~~ ionization", a stripping of electrons from surrounding atoms.

BETA RAYS, or beta radiation, is another form of radiation emitted by radioactive substances. They are ~~are~~ more penetrating than Alpha rays. Beta rays can be absorbed by simple sheets of aluminum.

GAMMA RAYS or gamma radiation...are extremely penetrating rays which are really the same thing as X-Rays.

DISS TO VTR SCENE #4 (Bomb at Los Alamos)

NARRATOR

Even though radiation and nuclear wastes have been around for thousands of years, even though <sup>early</sup> ~~discovery~~ discoveries brought many things to light, the world got its first real look at things nuclear in December 1942...when the first nuclear power plants "sprang" up almost overnight.



FADE INTO

FULL SCREEN: A ball of yarn is bouncing around; it's difficult to tell what it is. As preliminary credits begin to roll, SLOW PULL OUT TO TIGHT SCREEN: continuing ball of yarn.

(MUSIC UNDER CREDITS)

SLOW PULL OUT TO ECU BALL OF YARN. Every once in a while, a cat's paw is visible. CONTINUE SLOW PULL OUT TO MCU. Cat/yarn in LIMBO.

(KILL MUSIC)

NARRATOR

Our country has a problem.

LIMBO. Cat hits ball and it bounces into TIGHT SCREEN. SFX INTO EXPLOSION, TITLE ON SCREEN.

(MUSIC CRESCENDO AS BALL HITS)

NARRATOR

What do we do with nuclear waste? the question is both complex and controversial. It's like a giant ball of yarn, which gives an appearance of being in a kind of order, but which, as it unravels, proves to be a tangled snare.

KILL TITLE. Kitten is caught in yarn, MCU. INTO TIGHT SCREEN as hands reach down and begin to untangle kitten.

NARRATOR

Nuclear wastes are the products of our atomic age, but time...both in this presentation and in our world...does not afford the luxury of arguing pro or con nuclear power. Whether nuclear energy survives as an option or not, the wastes present will last thousands of years. Will we control them? Or they us? CAN we control them?

Kitten is untangled and the hands pick up the yarn and begin to separate it so that strands are visible.

NARRATOR

As the single strand which is this tangled ball is unraveled, it exposes a string of related issues. We will take a macro-view of the nuclear waste subject by examining four specific aspects of the question....



(2)

DISS. INTO GRAPHIC OF NUCLEAR SYMBOLS AND KEY TERMS AS THEY ARE MENTIONED: historical, technical, political, socio-ethical.

NARRATOR

We will talk about the history of nuclear waste; the technical implications, the political and the socio-ethical.

DISS. TO VTR SCENE #1 (KEY DATE OVER SCENE)

NARRATOR

How did we come to have the problem of nuclear waste? Where did nuclear waste begin and from what.

DISS. TO GLOBE IN LIMBO. SFX, stars, light patterns. Begin w/LS GLOBE; SLOW INTO TIGHT SCREEN of globe turning..

( NARRATOR'S VO MUSIC LOW BG, space type)

Radioactivity and nuclear fission are as old as time itself. It is quite natural to us to think of gas, oil or solar energy...yet today, many people are afraid of the "NUCLEAR", although it is as natural as either of the other two.

Radiation is present all around us...in the earth's crust...in ground water...in our air.

DISS. TO TIGHT SCREEN: rocky ground. Hand reaches down and picks up rock, PULL OUT FOR LS as silhouetted person throws rock into space.

NARRATOR

Rocks and soil contain uranium and thorium...a substance associated with rare earths and most commonly found in metallic substances. Thorium and uranium produce different radioactive elements through radioactive decay.

CUT TO VTR SCENE #2: Milling of uranium ore, if possible.

(KILL MUSIC)

NARRATOR

When we mill uranium ore, there is always a certain amount of radiation present...and when we use rock...like granite from these millings, we build a certain amount of radiation into the structure we construct.



(3)

DISS. TO: Woman in kitchen cooking.

~~Exxxxx~~the things we take for granted..natural gas used in home furnaces

NARRATOR

Even the things we take for granted....natural gas used in home furnaces  
and kitchen ranges produces a kind of radioactivity...randon, whêch we  
inhale through the lungs.

DISS. TO MEDICAA CENTER: Radiology Technician

NARRATOR

We use X-Rays and nuclear medicine to treat illness and disease;  
we use radiation in various diagnostic tests....

DISS TO GLOBE IN SPACE, AS IT SPINS, IT DISS TO:

NARRATOR

No, we can't get away from a certain amount of nuclear wastes.  
They are a natural result of the build up and decay of certain  
components of our earth. And, if they've always been there...  
why haven't we learned better what to do about them. Let's take a  
trip back through history.

ART CARD: TIGHT SCREEN: Early lab scene, Marie Curie. PULL OUT TO SHOW ENTIRETY.

KEY 1895, CENTER

NARRATOR

In 1895, in Germany, Wilhelm Roentgen discovered X-RAYS...radiation  
which could travel through metal sheets. At about the same time,  
in France, Henry Becquerel wrapped a small piece of uranium compound  
in a black paper and placed it on top of a similarly weapped photo-  
graphic plate. When he developed the plate, Bequerel discovered it  
was black. Something had penetrated the paper.



(4)

CUT TO ECU Marie Curie, PULL OUT TO SHOW: her early lab

NARRATOR

Also in France, Marie and P  rre Curie worked diligently on another experiment. They wanted to produce uranium...chemically. Through their experiments, they discovered that residues from their chemical operations were more radioactive than purified uranium.

Theirs was the discovery of radium, and the knowledge that radium is produced by the radioactive decay of uranium.

DISS. TO GRAPHICS: TERMS AND SYMBOLS FOR THE NUCLEAR CENTER SCREEN.

NARRATOR VO MUSIC

Madame Curie invented the term "radioactivity" to describe this process. It's in her honor that Ci..."curie"..the name for one unit of radioactivity...is used. One curie is the amount associated with one gram of radium.

DISS AGAIN TO EARLY LAB SCENE

NARRATOR

These nuclear pioneers soon discovered that exposure to penetrating radiation could be dangerous. Madame Curie's husband, Pierre, decided to use himself to determine just how dangerous.

DISS . TO ECU M Curie

NARRATOR

He strapped a small piece of radium to his arm and kept it there ten hours. His skin reddened. In 20 days, scabs had formed and 52 days later, the burns still were not completely healed. This experiment was not the cause of M Curie's death, however. He was killed when was run down by a horse-drawn carriage.

(5) DISS. TO SYMBOL FOR RADIATION. FULL SCREEN, simple animation, if possible or some kind of special effect.

(MUSIC UP & DOWN)



(11) ,CUT TO GRAPHIC, DIAGRAM OF CONVERSION OF WASTES TO OTHER FORMS. POSSIBLE SIMPLE SWITCHER ANIMATION AS EACH ONE IS DISCUSSED  
NARRATOR

About 15 years ago, waste officials began to convert the liquid wastes to other forms for more convenient...possibly safer containment. Here's one way they did it:

Evaporators were used to reduce the liquid volume of the wastes by a factor of five...the waste was converted to a damp salt cake.

Now, a process exists which can convert the salt cake to a glassine form. This process is called glassification...vitrification.... or solidification, depending on what the salt cake is converted to. Ceramics, glass and tektite....and a mineral matrix...are all currently under extensive research. What do the experts say about this?

DISS. TO VTR SCENE #13...SPEAKER...REASSURANCE...APPX 3:00--5:00, KEEP VTR SCENE, BRING NARRATOR VO" (Use key: name/title speaker)

NARRATOR

Again, there are differing opinions...

CUT TO VTR SCENE #14...SPEAKER...WARNING...APPX 3:00--5:00, KEEP VTR SCENE, BRING NARRATOR VO (use key; name/title/speaker)

NARRATOR

There are other forms which can be/are being used to contain nuclear wastes at present.

CUT TO GRAPHIC OF INEL/OAK RIDGE...

NARRATOR

At Idaho National Engineering Laboratory...INEL...the nuclear wastes were burned into a dandlike substance called calcine. This reduces the waste by a factor of nine or ten. At Oak Ridge National Laboratories, the wastes are evaporated, mixed with cement, and injected into fractures in the shale formation unberneath the lab.... a depth of 800 to 900 feet.



(12) CUT TO VTR SCENE #15 and KEY OPTIONS OVER VIDEO AS OPTIONS ARE MENTIONED:

NARRATOR

At present, the government is studying eight basic options for storage or disposal of nuclear wastes:

One: continue use of interim storage; build more temporary facilities

Two: Modify present facilities to entomb or bury wastes

Three: Store wastes in surface burial grounds

Four: Put nuclear wastes into deep geologic repositories...deep

drill holes or deep mined cavities...criteria for these possibilities is being developed..

Five: Place containers in deep drill holes in the ocean floor or in the arctic ice sheets

Six: Fire wastes into deep space or into the sun

Seven: Incorporate wastes into synthetic rocks or crystals compatible with their geologic formation

Eight: Convert wastes by transmutation into shorter-lived, less toxic materials. Do this by irradiation.

CUT TO GRAPHIC TITLE: GEOLOGIC FEASIBILITY

NARRATOR

Right now, the most technologically feasible/<sup>approach to containment of NW</sup>appears to be deep geologic burial.

CUT TO VTR SCENE #15, SITE, IF POSSIBLE OR FOOTAGE SHOWING HOW THIS IS ACCOMPLISHED

NARRATOR

The first <sup>proposed</sup> such/burial site was to be near Lyons, Kansas. ~~The~~ project was abandoned in 1972 because of water disappearance, undocumented drill holes and public outcry.

CUT TO VTR SCENE #16: WIPP, NEW MEXICO

NARRATOR

In 1975, a waste isolation pilot plant...WIPP...was proposed for a salt formation near Carlsbad, New Mexico. Currently, this project involves about 20,000 acres, mostly federal and state owned. Surface facilities will require about 100 acres, with extensive underground handling.

KEY OBJECTIVES OVER SCENE #16

NARRATOR

WIPP HAS THREE MAIN OBJECTIVES: One: to be a permanent facility for transuranic wastes. Two: To be a facility for experiments with various types of high level defense wastes in an actual repository environment. Three: to be a demonstration disposal site with capacity for up to 1000 spent fuel rods.

KEY FIGURES OVER SCENE #16,,AS OBJECTIVES ARE MENTIONED

WIPP wastes would be deposited at two levels: 2100 feet and 2600 feet.



(13) CONTINUE SCENE #16. KILL KEYS. NARRATOR VO SCENE

NARRATOR

We still need to study the behavior of deep geologic deposits subjected to high temperatures like than generated by radioactive materials. Many feel that WIPP could help determine these limitations, that it would experimentation in a real underground repository.. and that until we have that, we have only theory.

CUT TO VTR SCENE #17, SPEAKER...REASSURANCE.... 5:00--6:00. KEEP SCENE. PUT NARRATOR VO

NARRATOR

Of course, still others believe that deep geologic burial is as dangerous and as unneedful as any other disposal method.

CUT TO VTR SCENE #18...SPEAKER...WARNING....5:00--6:00. KEEP SCENE. PUT

NARRATOR VO: (KEY SPEAKER'S NAME/TITLE OVER SCENE WHILE HE/SHE IS SPEAKING)

NARRATOR

Part of the WIPP would be the research and development area. This area would be very closely instrument monitored. Only spent fuel assemblies which have cooled for at least ten years would be used at the WIPP. There is still debate.

CUT TO VTR SCENE #19. KEY SPEAKER'S NAME/TITLE WHILE SPEAKING. CUT AUDIO. KEEP SCENE, USE NARRATOR VO.

NARRATOR

Where is the WIPP located?

CUT TO GRAPH SHOWING LOCATION/ROCK FORMATIONS

NARRATOR

It's located in the Delaware Basin. The Delaware Basin is a salt formation 3600 feet thick. It was laid down approximately two million years ago. There are aquifers within the basin, but none within the salt itself.



September 22, 1979

Florence Chichester  
League of Women Voters Education Fund  
1730 M Street, N.W.  
Washington, D. C. 20036

Dear Florence,

I am delighted to report the following development in progress on the nuclear waste documentary.

I have met with Wanda Walser who has agreed to assist in this project as Writer. She has a wealth of background and experience from which to draw and advise. Most recently she had run her own writing and production business, Ideas Unltd.. Wanda is now establishing a department as the first Director of Community Relations at West Texas Hospital in Lubbock. As she and I both work from 8 to 5 she will only be free to devote evenings to writing.

We have established the following deadlines for the project based on projected availability of time and equipment. We feel these are firm dates:

- October 12 - transcripts of raw video completed
- October 20 - finished rough outline-script mailed
- November 1 - finish of first draft script mailed
- November 16 - second script finalized
- November 19 - begin 3/4" rough production
- November 27 - final rough complete, feedback from DOE in
- November 29 - begin TV station production up to 2"
- December 7 - target for finished 2" tapes, depending on TV station time available
- December 15 - distribution complete, negotiation with PBS in progress

I have enclosed a resume to further excite you about Wanda's abilities. The arrangement we have agreed upon will provide a fee of \$1,200. to her for her services. Any production or other expenses must be paid in addition.

As all grant monies must be spent by October 31, I would appreciate receiving the additional \$500. if that is still available, with any directives or restrictions which might apply to its use. I anticipate spending it to secure production time.

Unless there is further need for clarification on any of this, you will hear from me on October 20th, with a rough outline script.

Love,

*Patricia*  
Patricia Bruno



Wanda D. Walser



#### Qualifications

Sixteen years experience and education in mass communications, all media, as well as coordination of public relations, public service and advertising campaigns and audiovisuals on a local, regional, and in the case of print media, national and international levels. Proved ability in writing and research: published educational filmstrip writer, published fiction and non-fiction writer on regional, national levels. Well-honed interpersonal skills in many facets of communications area, including working with people on levels from top management to custodians. Experienced in coordination of people, props, locations and true elements for production of television commercials and special presentations. Experience in client presentations, as well as public speaking. Have served on several occasions as guest speaker in advertising classes at Texas Tech University and for two years consecutively as judge at the annual university copywriting competition.

#### Writing & Production

Began as a copywriter during days of live television and telops at KGNC-TV (now KAMR) Amarillo. Wrote, produced and directed commercials; did on-the-air work, client contact.

Became continuity director in charge of all commercial writing and production at KVII-TV, Amarillo. Supervised copy-concept and production; copy-contact duties and on-air work. Acted as liason between station production and ad agency copy.

Next served as continuity director for KGNC Radio, Amarillo, as copywriter, creative, client-contact. Supervised radio copy production. Liason between station personnel and ad agency creative, agency creative.

Worked with Monte Resenwald and Associated Advertising Agency, Amarillo, as copywriter, client-contact, creative on such accounts as Amarillo National Bank and Piggly Wiggly.



Jan., 1967 — Oct., 1974: Webster/Harris/Welborn Advertising Agency, Lubbock, Began as copy-writer, advanced to creative director. Supervised copy, radio, television and print production. Served as client-contact in cases where either Mr. Webster, Mr. Harris or both were out of town. Worked in all areas of public relations and advertising with such clients as Plains National Bank, Underwood's Barbeque Cafeterias and Lubbock Power and Light. Created and produced award-winning advertising and public relations campaigns during this time.

Oct., 1974—June, 1975: Buckner/Craig/Armstrong wrote and supervised copy and production for all accounts. Coordinated technical on-camera personnel for accounts. Implemented and produced new campaign for Gebo's stores during this time. Client contact, creative.

June, 1975 — Aug., 1976: Free-lanced from my home. Accounts included N. Armstrong Advertising Agency, for whom I wrote, designed and produced mixed media campaigns for such clients as Gebo's, Plains Cotton Growers, Inc., HPC Pump Company, Plains Cooperative Oil Mill and numerous others. During this time, also worked part-time as public information assistant to Walt Olivo at Plains Cooperative Oil Mill, where I wrote news releases, conducted oil mill tours.

Aug., 1976 — Present: Work in my own writing/production business, Ideas UnLtd., where I write design and produce everything from PR campaigns to brochures, audiovisuals, product news stories and direct mail for my various clients, among whom are N. Armstrong Advertising, Lokey Animal Research Center, Automated Food Systems, Inc., the City of Lubbock, Nutrition Management Consultants, Frymaster Corporation of Louisiana, and others.



Wanda Walser  
Page 3

## Publications

### 1975 — Present:

A series of filmstrips for grades seven--12, now being distributed on an international level.

My fiction has appeared in CONNECT (formerly TEEN POWER), THE WAR CRY of the Salvation Army; ST. ANTHONY MESSENGER and TEXAS FARM AND RANCH JOURNAL.

Non-fiction has appeared in FARMLAND NEWS, HOME LIFE, TEXAS FARM AND RANCH JOURNAL, SOUTHWEST AIRLINES MAGAZINE, THE BRANGUS JOURNAL.

My news releases, print ads and news stories have appeared in such publications as PROGRESSIVE FARMER and COTTON INTERNATIONAL.

My writing in such varied fields has necessitated extensive research in many areas, including agriculture, genetics, food processing, psychology, municipal operations and nutrition.

## Public Relations

While living in Hereford, Texas, I worked for a brief period as an M.D.s receptionist-bookkeeper. Skills developed here: patience in working with people not at their best because of ill health; took opportunity to learn as much as possible about medicine and the medical field.

## Education

Associate B.S. in Drama/Radio/Television, Amarillo Junior College, Amarillo, Texas, 1962. Freshman year, recipient of The Drama Award for best-written and produced closed-circuit television play.

B.S. in Journalism; minor in telecommunications, Texas Tech University, 1971 (under name Wanda DeHart Turner). Dean's list, 1970.

## Professional Organizations

Women In Communications, Inc.  
National Federation of Independent Business  
Associated Business Writers of America  
National Association of Female Executives

## References

Age: 36



(MUSIC LOW BG)

QUICK CUTS ON SCREEN: TEAC Rep, speaking; Politician; protestor, New Mexico;  
Governor, New Mexico; folk singer.... DISS TO:

(KEEP MUSIC LOW BG)

LS: Cat/yarn in Limbo. Yarn tangles cat. VERY SLOW IN AS NARRATOR WALKS ONTO SET  
talking as he walks

NARRATOR

Our country has a problem. What do we do with nuclear waste?  
The question is both complex and controversial. It's like a giant  
ball of yarn. There's an appearance of a kind of order...but as  
the ball unravels, it proves to be a tangled snare of many, inter-  
woven issues...

Narrator begins to untangle cat.

NARRATOR

If we face the truth, we have no choice about nuclear waste. We've  
got it. Forty years' worth. Whether nuclear energy survives as an  
option...wastes already present will last thousands of years. For  
our purposes here, the question is NOT nuclear power..then..as an  
energy option, but HOW WILL WE MANAGE NUCLEAR WASTES?

QUICK CUTS ON SCREEN:

NARRATOR

We worry about safety. We complain about costs. We argue technology.  
We distrust politics.

STILL FRAME ECU PERSON'S FACE

NARRATOR

How do we choose priorities?



VIDEO:

NARRATOR

Uppermost in everybody's mind: The safety issue.

DISS. TO TIGHT SCREEN: Rocky ground. Hand reaches down and picks up rock. PULL OUT FOR LS as sillhouetted person throws rock into space.

NARRATOR

Radioactivity and nuclear fisson are as old as time itself. Radiation is present all around us...in the erath's crust..in ground water...in our air.

(PLUG IN DENVER HERE. P. 15. PROBABLY CHILD [Yellow] )

VIDEO:

NARRATOR

No. We can't get away from a certain amount of nuclear wastes. They are a natural result of the build up and decay of certain components of our earth.

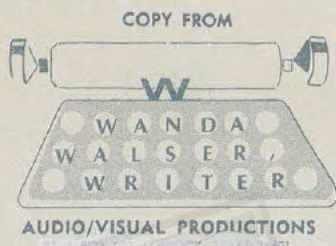
(PLUG IN: Govt standards; Helen Caldcott's theory; radiation for medicine..that makes waste; Marcuzio's Study...energy perspective)

(PLUG IN: Tolerance levels...govt standards; healthy workers' syndrome [control groups, overpopulation] milltailings [technological aspects] body contact...example...walking or pile of milltailings; pro & con quotes; hazard [does not presume body contact])

(Technological Aspects: define some terms: tru, wastes, etc.; how are nuclear wastes generated (fuel cycle..insert E)

INSERT D PLUG IN BEFORE INSERT E





Title \_\_\_\_\_

Prod. No. \_\_\_\_\_

Length \_\_\_\_\_

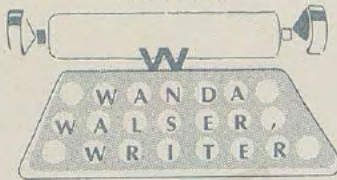
Date \_\_\_\_\_

VIDEO

AUDIO



COPY FROM



AUDIO/VISUAL PRODUCTIONS

RT. 1 BOX 801 LUBBOCK, TEXAS 79401

Title \_\_\_\_\_

Prod. No. \_\_\_\_\_

Length \_\_\_\_\_

Date \_\_\_\_\_

VIDEO

AUDIO



OTHER ASPECTS NEEDED:

1. Atoms for peace

Short history...Los Alamos, Sandia  
finances and research

How much research money put into where

NEED THE INDUSTRY'S ANGLE ON THIS

Government did this to get plutonium to make bombs, thus generated defense wastes.

Tie this to money, atomic research govt paid for.

NEED QUOTES HERE

Concerns: to get to project...

idea: we can handle wastes, so no money invested

SALT VAULT: First attempt to bury waste in Lyons, Kan.

WHAT ARE OUR OPTIONS IN X TERMS OF TIME.

Govt not spending money here:

deep geologic burial,

ocean burial

moon shots, etc.

GET INTO TECHNOLOGY HERE

WIPP

Govt agencies, work ~~these~~ these in chronological order; will be a part of the  
history.

RG...book...~~xx~~ policy



FADE INTO

*Call Patricia*  
*Monday* *WD #1* *Mon* *Dec. 10*

FULL SCREEN: A ball of yarn is bouncing around; it's difficult to tell what it is.  
As preliminary credits begin to roll, SLOW PULL OUT TO TIGHT SCREEN: continuing ball of yarn.

~~(MUSIC UNDER CREDITS)~~

SLOW PULL OUT TO ECU BALL OF YARN. Every once in a while, a cat's paw is visible.  
CONTINUE SLOW PULL OUT TO MCU. Cat/yarn in LIMBO.

~~(KILL MUSIC)~~

~~NARRATOR~~

~~Our country has a problem.~~

*fragments - diff. issues -*  
*rep - less -*  
*the*

LIMBO. Cat hits ball and it bounces into TIGHT SCREEN. SFX INTO EXPLOSION, TITLE ON SCREEN.

(MUSIC CRESCENDO AS BALL HITS)

NARRATOR

What do we do with nuclear waste? the question is both complex and controversial. It's like a giant ball of yarn, which gives an appearance of being in a kind of order, but which, as it unravels, proves to be a tangled snare.

*intro of video + more audio introduction into*  
*U. picks up cat - our country has a problem*  
*Introduce audio here -*  
*Wanted you to know more about -*  
*I was confused maybe*  
*we're going to have more issues... as complicated as*  
*play shirt + jeans*  
*we look at the nuclear waste issue*  
*any issue really*  
*Gov. Brown*  
*question*

KILL TITLE. Kitten is caught in yarn, MCU. INTO TIGHT SCREEN as hands reach down and begin to untangle kitten.

NARRATOR

Nuclear wastes are the products of our atomic age, but time...both in this presentation and in our world...does not afford the luxury of arguing pro or con nuclear power. Whether nuclear energy survives as an option or not, the wastes present will last thousands of years.  
Will we control them? Or they us? CAN we control them?

*Some* *(over)*

Kitten is untangled and the hands pick up the yarn and begin to separate it so that strands are visible.

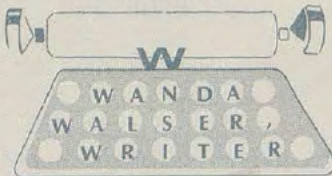
NARRATOR

As the single strand which is this tangled ball is unraveled, it exposes a string of related issues. We will take a macro-view of the nuclear waste subject by examining four specific aspects of the

*we're all going to have a kind of trap*  
*Insert*  
*we look at the nuclear waste issue*  
*any issue really*  
*Gov. Brown*  
*question*



COPY FROM



AUDIO/VISUAL PRODUCTIONS

RT. 1 BOX 101 LUBBOCK, TEXAS 79401

Title \_\_\_\_\_

Prod. No. \_\_\_\_\_

Length \_\_\_\_\_

Date \_\_\_\_\_

VIDEO

AUDIO



The problem is - We tend to view nuclear events as one ~~breath~~ <sup>breath</sup> that issue when it is in effect, more cloudy related to our ball of yarn -





Milton  
Holloway - policy  
TENRC

Doug Brown  
Gov. Clements  
office

# KEY TO VIDEO TERMS

LS--Long Shot

MLS--Medium Long Shot

MS--Medium Shot

KEY--a type of superimposition of one picture or graphics over another picture

VTR--Video Tape Recording

VO--Voice over video...the announcer is not seen on camera

OC--On Camera, usually used when the announcer or narrator appears on the screen

-----  
NOTE: On this script where VTR Scenes are called for and speaker's are specified, we will plug in those particular people to be used and put their actual quotes into the audio portion of the script.

We will also plug in more facts about the general subjects written in here.



(1)

FIRST  
WORK  
DRAFT

Call T.V. Station  
& W.D.C.

FADE INTO

FULL SCREEN: A ball of yarn is bouncing around; it's difficult to tell what it is. As preliminary credits begin to roll, SLOW PULL OUT TO TIGHT SCREEN: continuing ball of yarn.

(MUSIC UNDER CREDITS)

SLOW PULL OUT TO ECU BALL OF YARN. Every once in a while, a cat's paw is visible. CONTINUE SLOW PULL OUT TO MCU. Cat/yarn in LIMBO.

(KILL MUSIC)

NARRATOR

Our country has a problem.

LIMBO. Cat hits ball and it bounces into TIGHT SCREEN. SFX INTO EXPLOSION, TITLE ON SCREEN.

(MUSIC CRESCENDO AS BALL HITS)

NARRATOR

What do we do with nuclear waste? the question is both complex and controversial. It's like a giant ball of yarn, which gives an appearance of being in a kind of order, but which, as it unravels, proves to be a tangled snare.

KILL TITLE. Kitten is caught in yarn, MCU. INTO TIGHT SCREEN as hands reach down and begin to untangle kitten. (Softening)

NARRATOR

Nuclear wastes are the products of our atomic age, but time...both in this presentation and in our world...does not afford the luxury of arguing pro or con nuclear power. Whether nuclear energy survives as an option or not, the wastes present will last thousands of years. Will we control them? Or they us? CAN we control them?

Kitten is untangled and the hands pick up the yarn and begin to separate it so that strands are visible.

NARRATOR

As the single strand which is this tangled ball is unraveled, it exposes strings of related issues. We will take a macro-view of the nuclear waste subject by examining four specific aspects of the question



(3)

DISS. TO: Woman in kitchen cooking.

~~Even the~~ things we take for granted...natural gas used in home furnaces

NARRATOR

Even the things we take for granted....natural gas used in home furnaces and kitchen ranges produces a kind of radioactivity...random, which we inhale through the lungs.

DISS. TO MEDICAL CENTER: Radiology Technician

NARRATOR

We use X-Rays and nuclear medicine to treat illness and disease; we use radiation in various diagnostic tests....

DISS TO GLOBE IN SPACE, AS IT SPINS, IT DISS TO:

NARRATOR

*(Insert)*  
No, we can't get away from a certain amount of nuclear wastes. They are a natural result of the build up and decay of certain components of our earth. And, if they've always been there... why haven't we learned better what to do about them. Let's take a trip back through history.

ART CARD: TIGHT SCREEN: Early lab scene, Marie Curie. PULL OUT TO SHOW ENTIRETY.

KEY 1895, CENTER

NARRATOR

In 1895, in Germany, Wilhelm Roentgen discovered X-RAYS...radiation which could travel through metal sheets. At about the same time, in France, Henry Becquerel wrapped a small piece of uranium compound in a black paper and placed it on top of a similarly wrapped photographic plate. When he developed the plate, Becquerel discovered it was black. Something had penetrated the paper.



(2)

DISS. INTO GRAPHIC OF NUCLEAR SYMBOLS AND KEY TERMS AS THEY ARE MENTIONED: historical, technical, political, socio-ethical.

NARRATOR

We will talk about the history of nuclear waste; the technical implications, the political and the socio-ethical.

DISS. TO VTR SCENE #1 (KEY DATE OVER SCENE)

NARRATOR

How did we come to have the problem of nuclear waste? Where did nuclear waste begin and from what.

DISS. TO GLOBE IN LIMBO. SFX, stars, light patterns. Begin w/LS GLOBE; SLOW INTO TIGHT SCREEN of globe turning..

( NARRATOR'S VO MUSIC LOW BG, space type)

Radioactivity and nuclear fission are as old as time itself. *at present*  
is quite natural to us to think of gas, oil or solar energy...yet  
today, many people are afraid of the "NUCLEAR", although it is as  
natural as either of the other two.  
Radiation is present all around us...in the earth's crust...in ground  
water...in our air.

BISS. TO TIGHT SCREEN: rocky ground. Hand reaches down and picks up rock, PULL OUT FOR LS as silhouetted person throws rock into space.

NARRATOR

Rocks and soil contain uranium and thorium...a substance associated with rare earths and most commonly found in metallic substances. Thorium and uranium produce different radioactive elements through radioactive decay.

CUT TO VTR SCENE #2: Milling of uranium ore, if possible.

(KILL MUSIC)

NARRATOR

When we mill uranium ore, there is always a certain amount of radiation present...and when we use rock...like granite from these millings, we build a certain amount of radiation into the structure we construct



(4)

CUT TO ECU Marie Curie, PULL OUT TO SHOW: her early lab

NARRATOR

Also in France, Marie and P  rre Curie worked diligently on another experiment. They wanted to produce uranium...chemically. Through their experiments, they discovered that residues from their chemical operations were more radioactive than purified uranium.

Theirs was the discovery of radium, and the knowledge that radium is produced by the radioactive decay of uranium.

DISS. TO GRAPHICS: TERMS AND SYMBOLS FOR THE NUCLEAR CENTER SCREEN.

NARRATOR VO MUSIC

Madame Curie invented the term "radioactivity" to describe this process. It's in her honor that Ci..."curie". the name for one unit of radioactivity...is used. One curie is the amount associated with one gram of radium.

DISS AGAIN TO EARLY LAB SCENE

NARRATOR

These nuclear pioneers soon discovered that exposure to penetrating radiation could be dangerous. Madame Curie's husband, Pierre, decided to use himself to determine just how dangerous.

DISS . TO ECU M Curie

NARRATOR

He strapped a small piece of radium to his arm and kept it there ten hours. His skin reddened. In 20 days, scabs had formed and 52 days later, the burns still were not completely healed. This experiment was not the cause of M Curie's death, however. He was killed when was run down by a horse-drawn carriage.

(5) DISS TO SYMBOL FOR RADIATION: FULL SCREEN



(5) DISS. TO SYMBOL FOR RADIATION. FULL SCREEN, simple animation, if possible or some kind of special effect.

(MUSIC UP & DOWN)

NARRATOR

We could take much more time to examine the miracles of nuclear discovery but we must limit ourselves. Let's talk about some terms you've probably been hearing.

DISS. TO VTR SCENE #3 (people working in labs or working w/uranium and radium in some way) KEY TERMS CENTER SCREEN AS THEY ARE USED.

NARRATOR

Let's talk about ALPHA PARTICLES.

Alpha particles are properties of many of the heaviest nuclear species... like uranium and radium. These particles are really "rays". They are easily absorbed into ordinary paper.

Alpha particles are relatively harmless because they lose their energy through a process known as "~~ionization~~ ionization", a stripping of electrons from surrounding atoms.

BETA RAYS, or beta radiation, is another form of radiation emitted by radioactive substances. They are more penetrating than Alpha rays. Beta rays can be absorbed by simple sheets of aluminum.

GAMMA RAYS or gamma radiation...are extremely penetrating rays which are really the same thing as X-Rays.

DISS TO VTR SCENE #4 (Bomb at Los Alamos)

NARRATOR

Even though radiation and nuclear wastes have been around for thousands of years, even though <sup>early</sup> ~~discovery~~ discoveries brought many things to light, the world got its first real look at things nuclear in December 1942...when the first nuclear power plants "sprang" up almost overnight.



(6)

VTR SCENE #5 (ATOMIC POWER PLANT Pantex?)

NARRATOR

These first power plants nursed huge atomic piles inside lead-shielded walls. Inside these units, plutonium was created as the basis of materials for the bomb that was to come.

VTR SCENE #6 (50's & 60's)

NARRATOR

Since that December, nuclear power and resulting wastes have been constant sources of news and controversy. Today, we're bombarded with the pros, cons and in-betweens of the issue.. and the question is: WHAT TO DO ABOUT THE WASTES? The power itself is already here. This brings us out of the historical portion of the program and in to the second sphere: the technical aspects of nuclear wastes.

VTR SCENE #7, KEY TERMS AS THEY ARE DISCUSSED.

NARRATOR

We experience nuclear waste from two primary sources.

ONE: DEFENSE WASTES. Defense wastes are those resulting from defense programs and research and development and related activities of the Department of Energy.

These wastes include: Low level wastes, high level wastes and transuranium wastes. Categories of nuclear waste are determined by "nanocuries"...37 disintegrations per second of radioactive elements. Remember that one curie equals one unit of radioactivity.

FOR THE FOLLOWING NARRATIVE SEQUENCES, GRAPHICS WILL BE USED.

NARRATOR

Transuranium wastes are those containing elements with atomic numbers higher than uranium. They are primarily Alpha radiation, and can be contact handled.

High Level wastes are those extracted from irradiated fuel during reprocessing. These are high intensity, penetrating and of long-lived radioactivity. These must be handled by a remote device.

Low level wastes are all other wastes than Transuranium and High Level. *Intermediate wastes as of yet have no official definition but require shielding*

*define alpha curie*



NARRATOR

*Just*  
The second source of nuclear wastes is COMMERCIAL WASTE. These wastes are Spent fuel elements, Low Level Wastes, High Level Wastes and Transuranium wastes.

Spent fuel elements...the uranium rods used in powering nuclear plants, once used become themselves, a form of nuclear waste and must be dealt with accordingly.

DISS TO GRAPHIC: Diagram of fuel cycle.

NARRATOR

*Just*  
How are nuclear wastes generated? Look at this diagram.

The cycle begins with the mining of uranium. One ton of mined ore yields about two to three pounds of usable uranium which must be extracted in a milling process.

The extracted uranium is called yellow cake. The yellowcake is shipped to a plant and converted into uranium hexafluoride..  $UF_6$ , a solid.

Once heated,  $UF_6$  becomes a gas and allows the concentration of U-235, the uranium isotope that is needed for reactor fuel.

Next, the enrichment process increases the proportion of U-235 in the  $UF_6$ . During fabrication, the enriched  $UF_6$  gas is converted to solid uranium dioxide and formed into pellets. These pellets are placed in zircalloy rods, and this is then known as a fuel rod.

The fuel rods are shipped to reactor sites and there combined with control rods to form a fuel assembly. Multiple of these assemblies form the reactor core. There the fissioning atoms sustain a chain reaction. When this energy is harnessed, it's possible to produce electricity and to power nuclear ships.

After one or two years' use, enough fissions have formed in the rods that a sustained chain reaction is inhibited, and the spent fuel rod is removed and placed under water with other spent fuel rods. These are known as storage pools.



(8)

At this point, in the united States, the commerical fuel cycle stops. The next step in the fuel cycle is reprocessing which yelds plutonium, a major component for nuclear weapons.

In 1977, President Carter established a policy which prohibits commercial reprocessing of spent fuel rods. The purpose...to prevent the possibility that plutonium might be acquired by the wrong groups and made into weapons.

The U.S. Defense establishment and some foreign countries do continue the fuel cycle by reprosessing. They want to salvage still usable materials ...primarily plutonium and uranium.

After reprocessing, the uranium again enters the fuel cycle at the conversion plant.

The plutonium becomes weappns, power sources and is used in the space program. Anything left after uranium and plutonium are considered wastes.

DISS. TO MAP, USE SFX TO POINT OUT EACH LOCATION ON MAP, AS IT IS TALKED ABOUT.

NARRATOR

At present, COMMERCIAL low level wastes are buried in six places: Barnwell, South Carolina; Beatty, Nevada; Washington; Maxey Flats, Kentucky; Sheffield, Illinois, and West Valley, New York.

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DISS. TO TITLE: DEFENSE LOW LEVEL WASTES

NARRATOR

DEFENSE LOW LEVEL WASTES are much greater in volume and are buried in five major places and several minor sites:

CUT TO MAP ONCE AGAIN; SFX EACH SITE AS IT IS MENTIONED

NARRATOR

The major sites are: Hanford, Washington; Idaho Falls, Idaho; Los Alamos, New Mexico; Oak Ridge, Tennessee; Savannah River, South Carolina



NARRATOR

Of the current nuclear waste volume, LIQUIDS make up about 40 per cent. Salt cake, sludge and spent fuel rods represent almost all the remainder. Currently, spent fuel rods are...as was mentioned before...submerged in pools of water at reactor sites. This is considered a temporary measure. When a final decision is reached as to disposal, the spent rods will either be disposed of as waste or reprocessed.

---

CUT TO NUCLEAR FAMILY TREE GRAPH TO DESCRIBE THE FOLLOWING:

NARRATOR

Uranium mine and mill tailings, although not considered wastes, are of concern in the nuclear waste issue, because they ~~these~~ contain low concentrations of naturally occurring radioactive materials.

---

DISS. TO MINE SCENE *49*

NARRATOR

The tailings are generated in large quantities. These are presently stored on site at mining and milling operations. Here's why they are of such concern:

---

CUT BACK TO FAMILY TREE, USE CU'S to emphasize each property mentioned.

NARRATOR

Mill Tailings contain Radon and Radium, two radioactive elements of environmental concern. Radon is a noble gas that escapes easily into the atmosphere. Radium, the parent of radon, is a potential pollutant of surface groundwater.

Thorium 230 is the parent of Radium. The half life of these daughters is 80,000 years. Half life is the amount of time it takes for the isotope to lose exactly half its radioactivity.

---



NARRATOR

We will now discuss some of the measures taken to contain or dispose of nuclear wastes. As we discuss these possibilities, we'll be hearing from people around the country with varying opinions on these questions within the question.

VTR SCENE #10....STORAGE FACILITIES

NARRATOR

Presently most liquid nuclear wastes are stored in above ground tanks, and most solid wastes is buried in shallow trenches.

CUT TO GRAPHIC, CUT-AWAY OF STORAGE TANK

NARRATOR

The liquid wastes are highly acidic. Most of them are neutralized by the addition of sodium hydroxide. This doubles the volume of the liquid waste.

ON GRAPHIC, ANIMATION OF SEEPAGE FROM TANK

NARRATOR

Between 1958 and 1974, at Hanford...18 of the original 149 carbon steel tanks leaked. This released nearly half a million gallons of High Level waste into the soil. Officials there claim the wastes have remained above the water table.

At Savannah River, the tanks are composed of double walled steel liners set in four foot thick cement shells. They have had one leak. This resulted in the release of 100 gallons of high level waste into the ground.

What do experts have to say about this?

VTR SCENE #11.... SPEAKER.... REASSURANCE, APPX. 3:00--5:00 ; KEEP VTR SCENE, BRING IN NARRATOR VO

NARRATOR

There are differing opinions. \_\_\_\_\_ of \_\_\_\_\_ says....

VTR SCENE #12....SPEAKER...WARNING, APPX. 3:00--5:00.



(11) ,CUT TO GRAPHIC, DIAGRAM OF CONVERSION OF WASTES TO OTHER FORMS. POSSIBLE SIMPLE SWITCHER ANIMATION AS EACH ONE IS DISCUSSED  
NARRATOR

About 15 years ago, waste officials began to convert the liquid wastes to other forms for more convenient...possibly safer containment. Here's one way they did it:

Evaporators were used to reduce the liquid volume of the wastes by a factor of five...the waste was converted to a damp salt cake.

Now, a process exists which can convert the salt cake to a glassine form. This process is called glassification...vitrification... or solidification, depending on what the salt cake is converted to. Ceramics, glass and tektite....and a mineral matrix...are all currently under extensive research. What do the experts say about this?

DISS. TO VTR SCENE #13...SPEAKER...REASSURANCE...APPX 3:00--5:00, KEEP VTR (Use key: name/title speaker)  
SCENE, BRING NARRATOR VO"

NARRATOR

Again, there are differing opinions...

CUT TO VTR SCENE #14...SPEAKER...WARNING...APPX 3:00--5:00, KEEP VTR SCENE, BRING (use key; name/title/speaker)  
NARRATOR VO

NARRATOR

There are other forms which can be/are being used to contain nuclear wastes at present.

CUT TO GRAPHIC OF INEL/OAK RIDGE...

NARRATOR

At Idaho National Engineering Laboratory...INEL...the nuclear wastes were burned into a dandlike substance called calcine. This reduces the waste by a factor of nine or ten. At Oak Ridge National Laboratories, the wastes are evaporated, mixed with cement, and injected into fractures in the shale formation unberneath the lab...  
*a depth of 800 to 900 feet*



NARRATOR

(12)<sup>a</sup>  
proposed  
The first such/burial site was to be near Lyons, Kansas. The project was abandoned in 1972 because of water disappearance, undocumented drill holes and public outcry.

CUT TO VTR SCENE #16: WIPP, NEW MEXICO

NARRATOR

In 1975, a waste isolation pilot plant...WIPP...was proposed for a salt formation near Carlsbad, New Mexico. Currently, this project involves about 20,000 acres, mostly federal and state owned. Surface facilities will require about 100 acres, with extensive underground handling.

KEY OBJECTIVES OVER SCENE #16

NARRATOR

WIPP HAS THREE MAIN OBJECTIVES: One: to be a permanent facility for transuranic wastes. Two: To be a facility for experiments with various types of high level defense wastes in an actual repository environment. Three: to be a demonstration disposal site with capacity for up to 1000 spent fuel rods.

KEY FIGURES OVER SCENE #16,,AS OBJECTIVES ARE MENTIONED

WIPP wastes would be deposited at two levels: 2100 feet and 2600 feet.

(13) CONTINUE SCENE #16. KILL KEYS. NARRATOR VO SCENE

NARRATOR

We still need to study the behavior of deep geologic deposits subjected to high temperatures like than generated by radioactive materials. Many feel that WIPP could help determine these limitations, that it would experimentation in a real underground repository... and that until we have that, we have only theory.

CUT TO VTR SCENE #17, SPEAKER...REASSURANCE.... 5:00--6:00. KEEP SCENE. PUT

NARRATOR VO

NARRATOR

Of course, still others believe that deep geologic burial is as dangerous and as unneedful as any other disposal method.



NARRATOR

At present, the government is studying eight basic options for storage or disposal of nuclear wastes:

One: continue use of interim storage; build more temporary facilities

Two: Modify present facilities to entomb or bury wastes

Three: Store wastes in surface burial grounds

Four: Put nuclear wastes into deep geologic repositories...deep drill holes or deep mined cavities...criteria for these possibilities is being developed..

Five: Place containers in deep drill holes in the ocean floor or in the arctic ice sheets

Six: Fire wastes into deep space or into the sun

Seven: Incorporate wastes into synthetic rocks or crystals compatible with their geologic formation

Eight: Convert wastes by transmutation into shorter-lived, less toxic materials. Do this by irradiation.

CUT TO GRAPHIC TITLE: GEOLOGIC FEASIBILITY

NARRATOR

Right now, the most technologically feasible approach to containment of NW appears to be deep geologic burial.

CUT TO VTR SCENE #15, SITE, IF POSSIBLE OR FOOTAGE SHOWING HOW THIS IS ACCOMPLISHED

NARRATOR

The first such proposed burial site was to be near Lyons, Kansas. The project was abandoned in 1972 because of water disappearance, undocumented drill holes and public outcry.

CUT TO VTR SCENE #16: WIPP, NEW MEXICO

NARRATOR

In 1975, a waste isolation pilot plant...WIPP...was proposed for a salt formation near Carlsbad, New Mexico. Currently, this project involves about 20,000 acres, mostly federal and state owned. Surface facilities will require about 100 acres, with extensive underground handling.



CUT TO VTR SCENE #18...SPEAKER...WARNING....5:00--6:00. KEEP SCENE. PUT

NARRATOR VO: (KEY SPEAKER'S NAME/TITLE OVER SCENE WHILE HE/SHE IS SPEAKING)

NARRATOR

Part of the WIPP would be the research and development area.  
This area would be very closely instrument monitored. Only  
spent fuel assemblies which have cooled for at least ten years  
would be used at the WIPP. There is still debate.

CUT TO VTR SCENE #19. KEY SPEAKER'S NAME/TITLE WHILE SPEAKING. CUT AUDIO. KEEP  
SCENE, USE NARRATOR VO.

NARRATOR

Where is the WIPP located?

CUT TO GRAPH SHOWING LOCATION/ROCK FORMATIONS

NARRATOR

It's located in the Delaware Basin. The Delaware Basin is a  
salt formation 3600 feet thick. It was laid down approximately  
two million years ago. There are aquifers within the basin, but  
none within the salt itself.



(14)

DISS. TO SECOND GRAPH SHOWING STRATA AND LAYOUT OF WIPP

NARRATOR

There are two other unusual geologic conditions in the area...the presence of breccia pipes and anticlines.

KEY IN ARROW POINTING OUT BRECCIA PIPES.

NARRATOR

Breccia pipes are vertical underground columns of broken rock that is more permeable to water than is surrounding rock.

MOVE ARROW TO POINT OUT ANTICLINES

NARRATOR

An anticline is a very large mound of underground rock formed by intense pressure against rock strata. Anticlines in the Delaware Basin may contain gas and/or brine. Special precautions are being taken to assure a site a distance away from the presence of anticlines and breccia.

DISS. TO THIRD GRAPH SHOWING PRESENCE OF WIPP/GEOLOGIC PHENOMENA

NARRATOR

The closest known anticline is three miles from the WIPP site. Holes once drilled in explorations for gas, oil, potash and other fuels are now being plugged carefully to assure they won't become conduits for water which-would serve as a transport for radioactive elements into the biosphere.

CUT TO VTR SCENE #19

NARRATOR VO

Throughout Texas and New Mexico...where ever potential disposal sites have been publicized, questions have been

→ *next page*



raised. Citizens are concerned about several things.

(15)

DISS. TO GRAPH SHOWING OTHER NATURAL RESOURCES

One: What about the natural resources which lie below the earth's surface....for instance...in the case of the WIPP: Commercial natural/<sup>gas</sup> and oil deposits, which lie below the salt formation...and the potash deposits which lie above?

CUT TO VTR SCENE #20

NARRATOR VO

What frightens so many people is this: they are afraid that a project such as WIPP might be implemented on a pilot basis and later be expanded to a full scale nuclear waste repository...with out enough input from the citizens of the particular area. This, in turn has led to the asking of other questions:

KEY ISSUES OVER SCREEN AS THEY ARE MENTIONED. KEEP SCENE #20

NARRATOR VO

What about retrievability of deposited nuclear wastes in case they are needed or should be moved?

What about accidents from nuclear wastes deposits?

What about flooding both above and below ground?

What about heat stress, gas venting, humidity and extremely long-term isolation of nuclear wastes.

Here's what one citizen had to say:

CUT TO VTR SCENE #21 (KEY NAME/TITLE/AREA) ASSURANCE 5:00--6:00

There are others who feel that <sup>NARRATOR VO LAST FEW SECONDS</sup> the risks are too great.



(16)

CUT TO VTR SCENE #22 (KEY NAME/TITLE/AREA) WARNING 5:00-6:00

NARRATOR VO LAST FEW SECONDS

One of the big issues concerning nuclear waste is that of transportation...from point of origin to repository. Many people are frightened of what could occur between these two points.

CUT TO VTR SCENE #23 (TRANSPORTATION)

NARRATOR VO

For instance...if WIPP becomes operative, New Mexico highways will see an increased number of vehicles carrying radioactive wastes. So will the railways. Here are the estimates according to a 1978 Sandia Laboratories estimate:

CUT TO GRAPH DEPICTING LOADS RECEIVED AT WIPP

NARRATOR

If WIPP goes in to full operation, it's expected to receive: 37 truck loads and 28 rail cars of TRU wastes per week. Also: one truck load per week and seven rail cars per year of high level wastes

CUT TO GRAPHICS DEPECTING INTERNATIONAL REGULATIONS

NARRATOR

What is a good way to package and transport the wastes? Under U.S. and international regulations, low level wastes require only normal industrial packaging for shipment... they do not require special rail cars or other transport vehicles.

CUT TO GRAPH SHOWING TRU WASTE LEVEL PENETRATION

NARRATOR

TRU wastes don't require heavy shielding. They have very low levels of penetrating gamma radiation. BUT...TRU wastes do require ACCIDENT PACKAGING...because of their long life and the biological toxicity of plutonium and its potential contamination of people or objects when it's released from



NARRATOR

To transport TRU wastes...extreme containment will be stressed and several containment barriers will be provided in the packaging system. Transuranic wastes will be shipped either in a large "accident proof" box or in a bundle of 55-gallon drums, each ENCASED IN some kind of outer covering or protective container to protect TRU materials from impact and fire.

CUT TO GRAPHICS DEPECTING HLW

NARRATOR

High level wastes must be heavily shielded during transportation because of their radiation levels which produce a great deal of heat. They probably will be solidified and shipped as inert, immobile material which is nonexplosive, noncombustible and which cannot become gaseous or airborne.

CUT TO VTR SCENE #24 (REGULATION)

NARRATOR

There is, of course, regulation concerning the transportation of all hazardous materials, including nuclear wastes. The regulation begins with D.O.T....the Department of Transportation. Next, the Nuclear Regulatory Commission reviews commercial packaging designs to verify their adequacy.

CUT TO VTR SCENE #25

NARRATOR

As a matter of fact...to this point in time...highly radioactive from reprocessing wastes/have NOT been transported from points of origin to repositories. But, it's a matter of routine to ship unprocessed spent fuel.

CUT TO VTR SCENE #26 (LABORATORIES)

NARRATOR

Sandia Laboratories in Albuquerque, New Mexico is currently studying packaging for these wastes and designs are in the offing in preparation for permanent disposal at selected sites.

CUT TO VTR SCENE #27

NARRATOR

In order to be approved by NRC, however, these designs must first withstand several "torture" tests which produce damage conditions similar to what a package might actually encounter

*in a  
hypothetical  
severe  
transportation  
accident.*



NARRATOR

These tests..specified in the DOT and NRC regulations...include a high-speed impact test, a puncture test and a fire test. A water immersion test is also required. Container size..its adequacy concerning capacity and its ability to meet accident conditions and other scientific test criteria...is studied.

CUT TO VTR SCENE # 28

NARRATOR

What about insurance? What happens in a real-life accident situation? Is there some way to recoup damage or at least offer recompense to those involved?

CUT TO VTR SCENE #29

NARRATOR

No insurance policies written in the United States cover nuclear accidents. BUT...in 1957, the Price-Anderson Act was passed. This legislations authorizes The Department of Energy (DOE ) and The Nuclear Regulator Commission (NRC) to enter into indemnity agreements with contractors and licensee operating nuclear & facilities.

CUT TO VTR SCENE #30

NARRATOR

Through these particular agreements, the insurance industry provides up to 560 million per nuclear accident. DOE officials have said that financial ~~xxx~~ liability for WIPP related nuclear accidents involving radiation contamination, both~~e~~ operation and transportation related, would be assumed by the Federal Government under the Price-Anderson Act.



(19)

CUT TO VTR SCENE #31

However...just how much these agreements, according to the Price-Anderson Act...will x cover have not yet been established by the agencies involved, and their specific action will be required to set such policy. Critics have raised legal questions on the issues of liability, exemptions and coverage, stating that problems are not as easily resolved as DOE indicates.

CUT TO VTR SCENE #32 (KEY NAME/TITLE/AREA OF PERSON) 5:00-6:00 ~~ASMX~~ WARNING

NARRATOR VO LAST FEW SECONDS

This leads us, quite naturally to ask the question: Just who is in charge of policy...who does assume responsibility in case something happens...and just what are the Federal agencies and state agencies involved in this whole thing?

CUT TO CHART OF FEDERAL AGENCIES

NARRATOR

There are...were...five primary agencies involved in regulation and establishment of policy as far as nuclear wastes are concerned.

ONE: The ATOMIC ENERGY COMMISSION (AEC)...an agency which had responsibility for u.S. nuclear activities from 1946 to 1974.

CUT TO VTR SCENE #33

NARRATOR

THE AEC had authority to license privately owned facilities to use nuclear materials. In 1962, the AEC initiated an AGREEMENT STATES PROGRAM which allowed states to make agreements with the Federal government to regulate all low level nuclear activities, including certain low level commercial burial grounds within their boundaries.

CUT TO VTR SCENE #34

NARRATOR

New Mexico became an agreement state in 1974, Texas in \_\_\_\_\_.

But, the AEC retained the power to license commercial operators to dispose of TRU wastes.



CUT BACK TO CHART

NARRATOR

In 1974, The Energy Reorganization Act abolished the AEC and brought into being the Nuclear Regulatory Commission (NRC) and the Energy Research and Development Administration (ERDA).

(20)

COLOR IN NRC

NARRATOR

In 1974, the NRC, an independent board, which regulates all U.S. Commercial & nuclear activities was formed. It's an independent board whose members are appointed by the president.



(20)

COLOR IN NRC

NARRATOR

In 1974, the NRC, an independent board which regulates all U.S. Commercial nuclear activities was formed. It's an independent board whose members are appointed by the president.

COLOR IN ERDA

NARRATOR

Between 1974 and 1977, the Energy Research and Development Administration was responsible for the nuclear research and development formerly handled by the AEC. This responsibility included weapons production and energy development.

CUT TO VTR SCENE #35

NARRATOR

ERDA and its prime contractors were exempted...with some exceptions...from NRC regulations to preserve national security. In 1977, ERDA was abolished as an independent agency and was absorbed onto the department of energy.

CUT TO CHART OF FEDERAL AGENCIES; COLOR IN DOE

NARRATOR

The Department of Energy was formed in 1977. This agency was given the responsibility for nuclear research and development...this responsibility included the authority to conduct research necessary to policy-making where waste management, actual waste handling and storage of all defense wastes are concerned. This included disposal of commercial high level waste and/or spent fuel elements.

CUT TO VTR SCENE #36; KEY DOE DIVISIONS

NARRATOR

The Department of Energy's Waste Management Office includes a Division of Waste Isolation. This division selects sites; conducts research, development and demonstration work on a permanent repository.



(21)

KEEP VTR SCENE #36; CONTINUE KEYS OF DIVISIONS

NARRATOR

Inside DOE, a Division of Waste Products is in charge of waste handling and processing facilities for all types of civilian and military waste, as well as decommissioning and decontamination work.

The Division of Fuel Storage and Transfer handles both interior storage facilities and availability of transportation systems.

WIPP is the part of the Projects Staff of the Waste Management Office. DOE has authority to regulate its temporary waste storage and treatment activities.

CUT TO CHART OF FEDERAL AGENCIES; COLOR IN EPA

NARRATOR

The final agency responsible for certain aspects of nuclear wastes programs is the Environmental Protection Agency... responsible for providing environmental radiation protection criteria and standards.

CUT TO VTR SCENE #37

NARRATOR

The question of nuclear wastes has become national concern. People are asking what policies should be made and who should make them...and these questions in themselves are becoming just as controversial as the issues involved in the whole area of nuclear wastes themselves.

CUT TO VTR SCENE #38

NARRATOR

To this point, Congress has exercised control over nuclear waste disposal only through appropriations.

In 1978, Congress turned down funding for DOE to license WIPP. This was an attempt to be sure that WIPP would be constructed and operated with strict Congressional approval. At present, however, it's still not sure that a license is needed and the Nuclear Regulatory Commission has yet to set criteria for such licenses.



(22) CUT TO VTR SCENE #39; KEY 1979 & IRG CENTER SCREEN

NARRATOR

When President Carter set the National Energy Plan in motion, he ordered a review of U.S. Nuclear Waste Management. In 1979, The Interagency Review Group on Nuclear Waste Management (the IRG) presented its report to the president.

Today, however, there are still questions and the IRG has made no recommendations for the establishment of an Administrative policy in respect to long-term management of nuclear wastes. Neither have recommendations been made of supporting programs to implement any policy.

CUT TO VTR SCENE #40, SPEAKER PRO IRG "MISMANAGEMENT CHARGES", NARRATOR VO FIRST FEW SECS

NARRATOR

The IRG report says that for the past 30 years, management of radioactive wastes has experienced inadequate management of waste management research and development efforts with those for other parts of the nuclear fuel cycle.

BRING UP AUDIO ON IRG SPEAKER, KEY NAME/TITLE/PART OF COUNTRY 6:00--7:00

CUT TO GRAPHIC QUESTION WHAT IS POLICY/OBJECTIVE ANYWAY?

NARRATOR VO

Perhaps the question should first be asked and answered: just what constitutes a basis for policy? What is the primary objective of waste management planning?

CUT TO VTR SCENE #41; KEY OBJECTIVE: AND DEFINITION

NARRATOR

The primary objective of waste management planning should be to isolate all nuclear wastes from the niosphere and see that they pose no significant threat to public health and safety.

CUT TO VTR SCENE #42

NARRATOR

Further, IRG states that the responsibility for the public health and safety as concerns nuclear wastes...is the responsibility of the present generation. We cannot defer it



BRING NARRATOR VO LAST FEW SECS OF VIDEO

(23) CUT TO VTR SCENE #43, CROWD SCENE. KEY QUESTION: WHAT PART DOES CITIZEN PLAY, CENTER SCREEN.

NARRATOR

Precisely what is the role of the citizen in decision making on public issues...more specifically in the decision-making as far as the nuclear waste issue?

CUT TO VTR SCENE #44

NARRATOR

The issue of nuclear waste is a highly technical one. And... while it is good when you...the average citizen can become informed on the technicalities involved...you probably don't have the time to delve into the finite points as the scientists do. So... where can you do the most good?

CUT TO VTR SCENE #45

NARRATOR

You can be most effective when you express your concern as citizen. To do that, naturally, you must be as informed as possible on the issue. You must stay aware and current with the steps, procedures and timetable planned for the decision process.

CUT TO GRAPHIC; SWITCH IN POINTS AS THEY ARE NAMED

NARRATOR

How can you best do this? Know which appointed and elected officials have responsibility in the entire process of nuclear waste.

Know when and how to express your views...and the most appropriate person to express them to. Write directly to federal officials involved, since the federal level is where many final decisions will be made.

KILL KEY "POINTS" AND KEY "OFFICES"

NARRATOR

Write to the Executive Office of Science and Technology and The Division of Energy Technology at DOE.

Write to your representative in Congress.



is where many final decisions will be made.

KILL KEY "POINTS" AND KEY "OFFICES"

NARRATOR

Write to the Executive Office of Science and Technology and  
The Division of Energy Technology at DOE.

Write to your representative in Congress.

(25) KILL "OFFICES" AND KEY "POINTS"

Take time to attend hearings, conferences, help attain media  
coverage and write letters to editors.

Be persistent. After all, this is still your country, and you  
have a right to have a say and a voice in what happens...but  
you must realize that things happen slowly...and you must be  
able to hold out for the duration..

FADE SLOWLY INTO END OF YARN AS HANDREACHES IN AND PICKS IT UP.

Once decisions are made, it's not the end of the line for your  
involvement as a citizen.

HANDS BEGIN TO REWIND YARN AS KITTEN REACHES UP AND TRIES TO GRAB STRANDS

You must continue to watch what happens, to monitor policy,  
to take an active part in implementation of public policy.

These things are all as important as the other steps leading to  
decisions. Only through watchfulness can you and other citizens  
assure yourselves that policies

FADE INTO LS WOMAN SITTING IN ROCKER, CAT ON LAP. SHE IS KNITTING. BEGIN  
SLOW IN AS SHE PUTS DOWN NEEDLES AND END WITH CU OF SWEATER.

NARRATOR

WILL ACHIEVE DESIRED ENDS..that intent and purpose will be  
realized.

BRING MUSIC UP

ROLL CREDITS ACROSS SWEATER TO BEGIN WITH. KEEP CREDITS ROLLING AS QUICK  
CUTS OF PREVIOUS SCENES SHOW ON SCREEN: BOMB, LABORATORIES, SPEAKERS, ETC.  
END FINAL CREDITS OVER KITTEN TANGLED IN BALL OF YARN.



*Return Copy*

DEC 6 - 1979

KEY TO VIDEO TERMS

LS--Long Shot

MLS--Medium Long Shot

MS--Medium Shot

KEY--a type of superimposition of one picture or graphics over another picture

VTR--Video Tape Recording

VO--Voice over video...the announcer is not seen on camera

OC--On Camera, usually used when the announcer or narrator appears on the screen

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NOTE: On this script where VTR Scenes are called for and speaker's are specified, we will plug in those particular people to be used and put their actual quotes into the audio portion of the script.

We will also plug in more facts about the general subjects written in here.

*I'd like to know text of taped parts  
what the visuals are*



(2)

DISS. INTO GRAPHIC OF NUCLEAR SYMBOLS AND KEY TERMS AS THEY ARE MENTIONED: historical, technical, political, socio-ethical.

NARRATOR

We will talk about the history of nuclear waste; the technical implications, the political and the socio-ethical.

DISS. TO VTR SCENE #1 (KEY DATE OVER SCENE)

NARRATOR

How did we come to have the problem of nuclear waste? Where did nuclear waste begin and from what.

DISS. TO GLOBE IN LIMBO. SFX, stars, light patterns. Begin w/LS GLOBE; SLOW INTO TIGHT SCREEN of globe turning..

( NARRATOR'S VO MUSIC LOW BG, space type)

Radioactivity and nuclear fission are as old as time itself. It is quite natural to us to think of gas, oil or solar energy...yet today, many people are afraid of the "NUCLEAR", although it is as natural as either of the other two.

*Some elements produced in nuclear reactions do not naturally occur in nature.*

Radiation is present all around us...in the earth's crust...in ground water...in our air.

DISS. TO TIGHT SCREEN: rocky ground. Hand reaches down and picks up rock, PULL OUT FOR LS as silhouetted person throws rock into space.

NARRATOR

Rocks and soil contain uranium and thorium...a substance associated with rare earths and most commonly found in metallic substances. Thorium and uranium produce different radioactive elements through radioactive decay.

CUT TO VTR SCENE #2: Milling of uranium ore, if possible.

(KILL MUSIC)

NARRATOR

When we mill uranium ore, there is always a certain amount of radiation



FADE INTO

DEC 6 - 1979

FULL SCREEN: A ball of yarn is bouncing around; it's difficult to tell what it is. As preliminary credits begin to roll, SLOW PULL OUT TO TIGHT SCREEN: continuing ball of yarn.

(MUSIC UNDER CREDITS)

SLOW PULL OUT TO ECU BALL OF YARN. Every once in a while, a cat's paw is visible. CONTINUE SLOW PULL OUT TO MCU. Cat/yarn in LIMBO.

(KILL MUSIC)

NARRATOR

Our country has a problem.

*The Kitten imagery seems too playful and incongruous for the subject. In addition, the exaggerated contrast between the innocent, playful Kitten and the serious nuclear issues begins to immediately slant the picture a little bit.*

LIMBO. Cat hits ball and it bounces into TIGHT SCREEN. SFX INTO EXPLOSION, TITLE ON SCREEN

(MUSIC CRESCENDO AS BALL HITS)

NARRATOR

What do we do with nuclear waste? the question is both complex and controversial. It's like a giant ball of yarn, which gives an appearance of being in a kind of order, but which, as it unravels, proves to be

a tangled snare. *Exaggerating issue implies more disorder and incompetence than is the case.*

KILL TITLE. Kitten is caught in yarn, MCU. INTO TIGHT SCREEN as hands reach down and begin to untangle kitten. *(Softly)*

NARRATOR

Nuclear wastes are the products of our atomic age, but time...both in this presentation and in our world...does not afford the luxury of arguing pro or con nuclear power. Whether nuclear energy survives as an option or not, the wastes present will last thousands of years.

Will we control them? Or they us? CAN we control them?

*Suggesting the wastes are some kind of monster*

Kitten is untangled and the hands pick up the yarn and begin to separate it so that strands are visible.

NARRATOR

As the single strand which is this tangled ball is unraveled, it



DISS. TO: Woman in kitchen cooking.

Even the things we take for granted...natural gas used in home furnaces

NARRATOR

Even the things we take for granted...natural gas used in home furnaces  
and kitchen ranges produces <sup>radioactive element, radon,</sup> a kind of radioactivity...~~radon~~, which we  
inhale through the lungs.

DISS. TO MEDICAL CENTER: Radiology Technician

NARRATOR

We use X-Rays and nuclear medicine to treat illness and disease;  
we use radiation in various diagnostic tests....

DISS TO GLOBE IN SPACE, AS IT SPINS, IT DISS TO:

NARRATOR

No, we can't get away from a certain amount of nuclear wastes.  
They are a natural result of the build up and decay of certain  
components of our earth. And, if they've always been there...  
why haven't we learned better what to do about them. Let's take a  
trip back through history.

*not the same as  
naturally decaying  
elements.*

ART CARD: TIGHT SCREEN: Early lab scene, Marie Curie. PULL OUT TO SHOW ENTIRETY.

KEY 1895, CENTER

NARRATOR

In 1895, in Germany, Wilhelm Roentgen discovered X-RAYS...radiation  
which could travel through metal sheets. At about the same time,  
in France, Henry Becquerel wrapped a small piece of uranium compound  
in a black paper and placed it on top of a similarly wrapped photo-  
graphic plate. When he developed the plate, Becquerel discovered it  
was black. Something had penetrated the paper.



(4)

CUT TO ECU Marie Curie, PULL OUT TO SHOW: her early lab

NARRATOR

Also in France, Marie and P  rre Curie worked diligently on another experiment. They wanted to produce uranium...chemically. Through their experiments, they discovered that residues from their chemical operations were more radioactive than purified uranium.

Theirs was the discovery of radium, and the knowledge that radium is produced by the radioactive decay of uranium.

DISS. TO GRAPHICS: TERMS AND SYMBOLS FOR THE NUCLEAR CENTER SCREEN.

NARRATOR VO MUSIC

Madame Curie invented the term "radioactivity" to describe this process. It's in her honor that Ci..."curie"...the name for one unit of radioactivity...is used. One curie is the amount <sup>of radioactivity</sup> associated with one gram of radium.

DISS AGAIN TO EARLY LAB SCENE

NARRATOR

These nuclear pioneers soon discovered that exposure to penetrating radiation could be dangerous. Madame Curie's husband, Pierre, decided to use himself to determine just how dangerous.

DISS . TO ECU M Curie

NARRATOR

He strapped a small piece of radium to his arm and kept it there ten hours. His skin reddened. In 20 days, scabs had formed and 52 days later, the burns still were not completely healed. [This experiment was not the cause of M Curie's death, however. He was killed when was run down by a horse-drawn carriage.]

*Too Much History with little point.*

*What point are you trying to make from all this?*

*inappropriate & unnecessary*

DISS. TO SYMBOL FOR RADIATION. FULL SCREEN



(5) - DISS. TO SYMBOL FOR RADIATION. FULL SCREEN, simple animation, if possible or some kind of special effect.

(MUSIC UP & DOWN)

NARRATOR

We could take much more time to examine the miracles of nuclear discover, but we must limit ourselves. Let's talk about some terms you've probably been hearing.

What examination?

DISS. TO VTR SCENE #3 (people working in labs or working w/uranium and radium in some way) KEY TERMS CENTER SCREEN AS THEY ARE USED.

NARRATOR

Let's talk about ALPHA PARTICLES.

Alpha particles are properties of many of the heaviest nuclear species... like uranium and radium. These particles are really "rays". They are easily absorbed into ordinary paper.

Can you use a more understandable term?

Alpha particles are relatively harmless because they lose their energy through a process known as "~~ionization~~ ionization", a stripping of electrons from surrounding atoms.

See Beane's pub - p. 13

BETA RAYS, or beta radiation, is another form of radiation emitted by radioactive substances. They are more penetrating than Alpha rays. Beta rays can be absorbed by simple sheets of aluminum.

GAMMA RAYS or gamma radiation...are extremely penetrating rays which are really the same thing as X-Rays.

DISS TO VTR SCENE #4 (Bomb at Los Alamos)

NARRATOR

Even though radiation and nuclear wastes have been around for thousands of years, even though <sup>early</sup> discoveries brought many things to light, the world got its first real look at things nuclear in December 1942...when the first nuclear power plants "sprang" up almost overnight.

NO! - reactors

The "world" did not get its first real look - it was all top secret.

Not clearly explained

See MB pub p. 15-16



(6)

VTR SCENE #5 (ATOMIC POWER PLANT Pantex?)

*reactor* NARRATOR

These first ~~power~~ *reactor* plants nursed huge atomic piles inside lead-shielded walls. Inside these units, plutonium was created as the basis of materials for the bomb that was to come.

VTR SCENE #6 (50's & 60's)

NARRATOR

Since that December, nuclear ~~power~~ *energy* and resulting wastes have been constant sources of news and controversy. Today, we're bombarded with the pros, cons and in-betweeners of the issue.. and the question is: WHAT TO DO ABOUT THE WASTES? The power itself is already here. This brings us out of the historical portion of the program and in to the second sphere: the technical aspects of nuclear wastes.

VTR SCENE #7, KEY TERMS AS THEY ARE DISCUSSED.

NARRATOR

We experience nuclear waste from two primary sources. ONE: DEFENSE WASTES. Defense wastes are those resulting from defense programs and research and development and related activities of the Department of Energy.

These wastes include: Low level wastes, high level wastes and transuranium wastes. Categories of nuclear waste are determined by "nanocuries"...37 disintegrations per second of radioactive element. Remember that one curie equals one unit of radioactivity.

FOR THE FOLLOWING NARRATIVE SEQUENCES, GRAPHICS WILL BE USED.

NARRATOR

*be Her definition needed* Transuranium wastes are those containing elements with atomic numbers higher than uranium. They ~~are~~ *emit* primarily Alpha radiation, and can be contact handled.

High Level wastes are those extracted from irradiated fuel during reprocessing. These are high intensity, penetrating and *radioactively* long-lived ~~radioactivity~~. These must be handled by a remote device.

*better description needed* Low level wastes are all other....



NARRATOR

The second source of nuclear wastes is COMMERCIAL WASTE. These wastes are Spent fuel elements, Low Level Wastes, High Level Wastes and Transuranium wastes.

*only because  
of reprocessing  
ban*

Spent fuel elements...the uranium rods used in powering nuclear plants, once used become themselves, a form of nuclear waste and must be dealt with accordingly.

DISS TO GRAPHIC: Diagram of fuel cycle.

NARRATOR

How are nuclear wastes generated? Look at this diagram.

The cycle begins with the mining of uranium. One ton of mined ore yields about two to three pounds of usable uranium which must be extracted in a milling process.

The extracted uranium is called yellow cake. The yellowcake is shipped to a plant and converted into uranium hexafluoride..  $UF_6$ , a solid.

Once heated,  $UF_6$  becomes a gas and allows the concentration of U-235, the uranium isotope that is needed for reactor fuel.

Next, the enrichment process increases the proportion of U-235 in the  $UF_6$ . During fabrication, the enriched  $UF_6$  gas is converted to solid uranium dioxide and formed into pellets. These pellets are placed in zircalloy rods, and this is then known as a fuel rod.

The fuel rods are shipped to reactor sites and there combined with control rods to form a fuel assembly. Multiple of these assemblies form the reactor core. There the fissioning atoms sustain a chain reaction. When this energy is harnessed, it's possible to produce electricity and to power nuclear ships.

*you need  
to (in 1  
sentence) say  
what that  
means.*

After one or two years' use, enough fissions <sup>products</sup> have formed in the rods that a sustained chain reaction is inhibited, and the spent fuel rod is removed and placed under water with other spent fuel rods. These are known as storage pools.

*See  
MB's  
description  
of the  
fuel cycle  
pp. 5-7*



(8)

At this point, in the United States, the commercial fuel cycle stops. The next step in the fuel cycle is reprocessing which yields plutonium, a major component for nuclear weapons.

In 1977, President Carter established a policy which prohibits commercial reprocessing of spent fuel rods. The purpose...to prevent the possibility that plutonium might be acquired by the wrong groups and made into weapons.

The U.S. Defense establishment and some foreign countries do continue the fuel cycle by reprocessing. They want to salvage still usable materials...primarily plutonium and uranium.

After reprocessing, the uranium again enters the fuel cycle at the conversion plant.

The plutonium becomes weapons, power sources and is used in the space program. Anything left after uranium and plutonium are considered wastes.

DISS. TO MAP, USE SFX TO POINT OUT EACH LOCATION ON MAP, AS IT IS TALKED ABOUT.

NARRATOR

At present, COMMERCIAL low level wastes are buried in six places: Barnwell, South Carolina; Beatty, Nevada; Hanford, Washington; Maxey Flats, Kentucky; Sheffield, Illinois, and West Valley, New York.

DISS. TO TITLE: DEFENSE LOW LEVEL WASTES

NARRATOR

DEFENSE LOW LEVEL WASTES are much greater in volume and are buried in five major places and several minor sites:

CUT TO MAP ONCE AGAIN; SFX EACH SITE AS IT IS MENTIONED

NARRATOR

The major sites are: Hanford, Washington; Idaho Falls, Idaho; Los Alamos, New Mexico; Oak Ridge, Tennessee; Savannah River, South Carolina

never  
define LLW  
+ HLW

Needs  
updating

See

MB

pp. 19-24

Be consistent



H.W. or L.W.  
NARRATOR

Of the current nuclear waste volume, LIQUIDS make up about 40 per cent. Salt cake, sludge and spent fuel rods represent almost all the remainder. Currently, spent fuel rods are...as was mentioned before...submerged in pools of water at reactor sites. This is considered a temporary measure. When a final decision is reached as to disposal, the spent rods will either be disposed of as waste or reprocessed.

CUT TO NUCLEAR FAMILY TREE GRAPH TO DESCRIBE THE FOLLOWING:

NARRATOR

Yes they are!  
Uranium mine and mill tailings, although not considered wastes are of concern in the nuclear waste issue, because they ~~these~~ contain low concentrations of naturally occurring radioactive materials.

DISS. TO MINE SCENE

NARRATOR

The tailings are generated in large quantities. These are presently stored on site at mining and milling operations. Here's why they are of such concern:

CUT BACK TO FAMILY TREE, USE CU'S to emphasize each property mentioned.

NARRATOR

Mill Tailings contain Radon and Radium, two radioactive elements of environmental concern. Radon is a noble gas that escapes easily into the atmosphere. Radium, the parent of radon, is a potential pollutant of surface groundwater.

Thorium 230 is the parent of Radium. The half life of these daughters is 80,000 years. Half life is the amount of time it takes for the isotope to lose exactly half its radioactivity.

You don't explain radioactive decay enough to understand about "parent" or "daughter" elements



NARRATOR

We will now discuss some of the measures taken to contain or dispose of nuclear wastes. As we discuss these possibilities, we'll be hearing from people around the country with varying opinions on these questions within the question. — *style*

VTR SCENE #10....STORAGE FACILITIES

*HLW*  
NARRATOR

Presently most liquid nuclear wastes are stored in above ground tanks, and most solid wastes *are* buried in shallow trenches. *LLW*

CUT TO GRAPHIC, CUT-AWAY OF STORAGE TANK

NARRATOR

The liquid wastes are highly acidic. Most of them *have been* neutralized by the addition of sodium hydroxide, *hereby doubling* This doubles the volume of the liquid waste.

ON GRAPHIC, ANIMATION OF SEEPAGE FROM TANK

NARRATOR

Between 1958 and 1974, at Hanford...18 of the original 149 carbon steel tanks *containing ....* leaked. This released nearly half a million gallons of High Level waste into the soil. Officials there claim the wastes have remained above the water table.

At Savannah River, the tanks are composed of double walled steel liners set in four foot thick cement shells. They have had one leak. This resulted in the release of 100 gallons of high level waste into the ground.

What do experts have to say about this?

VTR SCENE #11.... SPEAKER.... REASSURANCE, APPX. 3:00--5:00 ; KEEP VTR SCENE.  
BRING IN NARRATOR VO

NARRATOR

There are differing opinions. \_\_\_\_\_ of \_\_\_\_\_ says....

*Just one?*



(11) ,CUT TO GRAPHIC, DIAGRAM OF CONVERSION OF WASTES TO OTHER FORMS. POSSIBLE SIMPLE SWITCHER ANIMATION AS EACH ONE IS DISCUSSED  
NARRATOR

About 15 years ago, waste officials began to convert the liquid wastes to other forms for more convenient...possibly safer containment. Here's one way they did it:

Evaporators were used to reduce the liquid volume of the wastes by a factor of five...the waste was converted to a damp salt cake.

Now, a process exists which can convert the salt cake to a glassine form. This process is called glassification...vitrification... or solidification, depending on what the salt cake is converted to. Ceramics, glass and tektite...and a mineral matrix...are all currently under extensive research. What do the experts say about this?

*Can it?  
MB, in her research,  
seems to have found  
that only the calcine  
can be vitrified--  
that salt cake cannot.*

DISS. TO VTR SCENE #13...SPEAKER...REASSURANCE...APPX 3:00--5:00, KEEP VTR (Use key: name/title speaker)  
SCENE, BRING NARRATOR VO"

NARRATOR

Again, there are differing opinions...

CUT TO VTR SCENE #14...SPEAKER...WARNING...APPX 3:00--5:00, KEEP VTR SCENE, BRING (use key; name/title/speaker)  
NARRATOR VO

NARRATOR

There are other forms which can be/are being used to contain nuclear wastes at present.

CUT TO GRAPHIC OF INEL/OAK RIDGE...

NARRATOR

At Idaho National Engineering Laboratory...INEL...the nuclear wastes were burned into a dandlike substance called calcine. This reduces the waste by a factor of nine or ten. At Oak Ridge National Laboratories, the wastes are evaporated, mixed with cement, and injected into the ground in the form of a slurry beneath the lab...



At present, the government is studying eight basic options for storage or disposal of nuclear wastes:

One: ~~continue use of interim storage; build more temporary facilities~~ ✓

Two: ~~Modify present facilities to entomb or bury wastes.~~ ✓

Three: ~~Store wastes in surface burial grounds~~ ✓

Four: Put nuclear wastes into deep geologic repositories...deep drill holes or deep mined cavities...criteria for these possibilities is being developed..

Five: Place containers in deep drill holes in the ocean floor or in the arctic ice sheets

✓ Six: ~~Fire wastes into deep space or into the sun~~

Seven: Incorporate wastes into synthetic rocks or crystals compatible with/ a geologic formation

Eight: Convert wastes by transmutation into shorter-lived, less toxic materials. Do this by irradiation.

CUT TO GRAPHIC TITLE: GEOLOGIC FEASIBILITY

NARRATOR

Right now, the most technologically feasible/<sup>approach to containment of nuclear waste</sup> appears to be deep geologic burial.

CUT TO VTR SCENE #15, SITE, IF POSSIBLE OR FOOTAGE SHOWING HOW THIS IS ACCOMPLISHED

NARRATOR

The first <sup>proposed</sup> such/burial site was to be <sup>a salt mine</sup> near Lyons, Kansas. The project was abandoned in 1972 because of water disappearance, undocumented drill holes and public outcry.

CUT TO VTR SCENE #16: WIPP, NEW MEXICO

NARRATOR

In 1975, a waste isolation pilot plant...WIPP...was proposed for a salt formation near Carlsbad, New Mexico. Currently, this project involves about 20,000 acres, mostly federal and state owned. Surface facilities will require about 100 acres, with extensive underground handling.

larger underground area for extensive handling?

Perhaps you should list the two main options and just two others that are most interesting and still considered.

See MB pp 29-34

Far future scientific speculation

mainly salt



(12)a

proposed  
The first such/burial site was to be near Lyons, Kansas. The project was abandoned in 1972 because of water disappearance, undocumented drill holes and public outcry.

CUT TO VTR SCENE #16: WIPP, NEW MEXICO

NARRATOR

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KEY OBJECTIVES OVER SCENE #16

NARRATOR

WIPP HAS THREE MAIN OBJECTIVES: One: to be a permanent facility for transuranic wastes. Two: To be a facility for experiments with various types of high level defense wastes in an actual repository environment. Three: to be a demonstration disposal site with capacity for up to 1000 spent fuel rods.

KEY FIGURES OVER SCENE #16,,AS OBJECTIVES ARE MENTIONED

WIPP wastes would be deposited at two levels: 2100 feet and 2600 feet.

(13) CONTINUE SCENE #16. KILL KEYS. NARRATOR VO SCENE

NARRATOR

We still need to study the behavior of deep geologic deposits subjected to high temperatures ~~like that~~ generated by radioactive materials. Many feel that WIPP could help determine these limitations, that it would <sup>be</sup> experimentation in a real underground repository... and that until we have that, we have only theory.

CUT TO VTR SCENE #17, SPEAKER...REASSUPANCE.... 5:00--6:00. KEEP SCENE. PUT

NARRATOR VO

NARRATOR

Of course, still others believe that deep geologic burial is as dangerous and as unneedful as any other disposal method.

WIPP

needs updating

See MB p. 36a

not to update

out

out



CUT TO VTR SCENE #19. KEY SPEAKER'S NAME/TITLE OVER SCENE WHILE HE/SHE IS SPEAKING)

NARRATOR

Part of the WIPP would be the research and development area.  
This area would be very closely instrument monitored. Only  
spent fuel assemblies which have cooled for at least ten years  
would be used at the WIPP. There is still debate.

CUT TO VTR SCENE #19. KEY SPEAKER'S NAME/TITLE WHILE SPEAKING. CUT AUDIO. KEEP  
SCENE, USE NARRATOR VO.

NARRATOR

Where is the WIPP located?

CUT TO GRAPH SHOWING LOCATION/ROCK FORMATIONS

NARRATOR

It's located in the Delaware Basin. The Delaware Basin is a  
salt formation 3600 feet thick. It was laid down approximately  
two million years ago. There are aquifers within the basin, but  
none within the salt itself.

too cut-up  
disorganized



(14)

DISS. TO SECOND GRAPH SHOWING STRATA AND LAYOUT OF WIPP

NARRATOR

? There are two other unusual geologic conditions in the area...the presence of breccia pipes and anticlines.

*not necessarily unusual to that area*

KEY IN ARROW POINTING OUT BRECCIA PIPES.

NARRATOR

Breccia pipes are vertical underground columns of broken rock that is more permeable to water than is surrounding rock.

*shorten and organize*

MOVE ARROW TO POINT OUT ANTICLINES

NARRATOR

An anticline is a very large mound of underground rock formed by intense pressure against rock strata. Anticlines in the Delaware Basin may contain gas and/or brine. Special precautions are being taken to assure a site a distance away from the presence of anticlines and breccia.

DISS. TO THIRD GRAPH SHOWING PRESENCE OF WIPP/GEOLOGIC PHENOMENA

NARRATOR

The closest known anticline is three miles from the WIPP site. Holes once drilled in explorations for gas, oil, potash and other fuels are now being plugged carefully to assure they won't become conduits for water which would serve as a transport for radioactive elements into the biosphere.

CUT TO VTR SCENE #19

NARRATOR VO

Throughout Texas and New Mexico...where ever potential



*organization*

raised. Citizens are concerned about several things.

(15)

DISS. TO GRAPH SHOWING OTHER NATURAL RESOURCES

One: What about the natural resources which lie below the earth's surface....for instance...in the case of the WIPP: Commercial natural/<sup>gas</sup> and oil deposits, which lie below the salt formation...and the potash deposits which lie above?

CUT TO VTR SCENE #20

*not related*  
NARRATOR VO

What frightens so many people is this: they are afraid that a project such as WIPP might be implemented on a pilot basis and later be expanded to a full scale nuclear waste repository...with out enough input from the citizens of the particular area. This, in turn has led to the asking of other questions:

KEY ISSUES OVER SCREEN AS THEY ARE MENTIONED. KEEP SCENE #20

NARRATOR VO

What about retrievability of deposited nuclear wastes in case they are needed or should be moved?

What about accidents from nuclear wastes deposits?

What about flooding both above and below ground?

What about heat stress, gas venting, humidity and extremely long-term isolation of nuclear wastes.

Here's what one citizen had to say:

CUT TO VTR SCENE #21 (KEY NAME/TITLE/AREA) ASSURANCE 5:00--6:00



(16)

CUT TO VTR SCENE #22 (KEY NAME/TITLE/AREA) WARNING 5:00-6:00

NARRATOR VO LAST FEW SECONDS.

One of the big issues concerning nuclear waste is that of transportation...from point of origin to repository. Many people are frightened of what could occur between these two points.

CUT TO VTR SCENE #23 (TRANSPORTATION)

NARRATOR VO

For instance...if WIPP becomes operative, New Mexico highways will see an increased number of vehicles carrying radioactive wastes. So will the railways. Here are the estimates according to a 1978 Sandia Laboratories estimate:

CUT TO GRAPH DEPICTING LOADS RECEIVED AT WIPP

NARRATOR

If WIPP goes in to full operation, it's expected to receive: 37 truck loads and 28 rail cars of TRU wastes per week. Also: one truck load per week and seven rail cars per year of high level wastes

CUT TO GRAPHICS DEPECTING INTERNATIONAL REGULATIONS

NARRATOR

What is a good way to package and transport the wastes? Under U.S. and international regulations, low level wastes require only normal industrial packaging for shipment... they do not require special rail cars or other transport vehicles.

CUT TO GRAPH SHOWING TRU WASTE LEVEL PENETRATION

NARRATOR

TRU wastes don't require heavy shielding. They have very low levels of penetrating gamma radiation. BUT...TRU wastes do require ACCIDENT PACKAGING...because of their long life and the biological toxicity of plutonium and its potential contamination of people or plants when it is released.

Transportation  
OK but  
trim  
See MB for updating  
pp 28a-28d



CUT TO GRAPH SHOWING HOW TRU WASTES WILL BE CONTAINED BY TRANSPORTATION

NARRATOR

To transport ~~TRU~~ wastes...extreme containment will be stressed and several containment barriers will be provided in the packaging system. Transuranic wastes will be shipped either in a large "accident proof" box or in a bundle of 55-gallon drums, each ENCASED IN some kind of outer covering or protective container to protect TRU materials from impact and fire.

CUT TO GRAPHICS DEPECTING HLW

NARRATOR

High level wastes must be heavily shielded during transportation because of their radiation levels which produce a great deal of heat. They probably will be solidified and shipped as inert, immobile material which is nonexplosive, noncombustible and which cannot become gaseous or airborne.

CUT TO VTR SCENE #24 (REGULATION)

NARRATOR

There is, of course, regulation concerning the transportation of all hazardous materials, including nuclear wastes. The regulation begins with D.O.T....the Department of Transportation. Next, the Nuclear Regulatory Commission reviews commercial packaging designs to verify their adequacy.

CUT TO VTR SCENE #25

NARRATOR

As a matter of fact...to this point in time...highly radioactive wastes/have NOT been transported from points of origin to repositories. But, it's a matter of routine to ship unprocessed spent fuel.

CUT TO VTR SCENE #26 (LABORATORIES)

NARRATOR

Sandia Laboratories in Albuquerque, New Mexico is currently studying packaging for these wastes and designs are in the offing in preparation for permanent disposal at selected sites.

CUT TO VTR SCENE #27

NARRATOR

In order to be approved by NRC, however, these designs must first withstand several "torque" tests which produce damage

*in a  
hypothesis  
severe  
transportation  
accidents*



NARRATOR

These tests..specified in the DOT and NRC regulations...include a high-speed impact test, a puncture test and a fire test. A water immersion test is also required. Container size..its adequacy concerning capacity and its ability to meet accident conditions and other scientific test criteria...is studied.

CUT TO VTR SCENE # 28

NARRATOR

What about insurance? What happens in a real-life accident situation? Is there some way to recoup damage or at least offer recompense to those involved?

CUT TO VTR SCENE #29

NARRATOR

No insurance policies written in the United States cover nuclear accidents. BUT...in 1957, the Price-Anderson Act was passed. This legislation authorizes The Department of Energy (DOE ) and The Nuclear Regulator Commission (NRC) to enter into indemnity agreements with contractors and licensee operating nuclear facilities.

CUT TO VTR SCENE #30

NARRATOR

Through these particular agreements, the insurance industry provides up to 560 million per nuclear accident. DOE officials have said that financial liability for WIPP-related nuclear accidents involving radiation contamination, both operation and transportation related, would be assumed by the Federal Government under the Price-Anderson Act.



However...just how much these agreements, according to the Price-Anderson Act...will & cover have not yet been established by the agencies involved, and their specific action will be required to set such policy. Critics have raised legal questions on the issues of liability, exemptions and coverage, stating that problems are not as easily resolved as DOE indicates.

CUT TO VTR SCENE #32 (KEY NAME/TITLE/AREA OF PERSON) 5:00-6:00 A88MX WARNING

NARRATOR VO LAST FEW SECONDS

This leads us, quite naturally to ask the question: Just who is in charge of policy...who does assume responsibility in case something happens...and just what are the Federal agencies and state agencies involved in this whole thing?

CUT TO CHART OF FEDERAL AGENCIES

NARRATOR

There are...were...five primary agencies involved in regulation and establishment of policy as far as nuclear wastes are concerned.

ONE: The ATOMIC ENERGY COMMISSION (AEC)...an agency which had responsibility for U.S. nuclear activities from 1946 to 1974.

CUT TO VTR SCENE #33

NARRATOR

THE AEC had authority to license privately owned facilities to use nuclear materials. In 1962, the AEC initiated an AGREEMENT STATES PROGRAM which allowed states to make agreements with the Federal government & to regulate all low level nuclear activities, including certain low level commercial burial grounds within their boundaries.

CUT TO VTR SCENE #34

NARRATOR

New Mexico became an agreement state in 1974, Texas in \_\_\_\_\_.

But, the AEC retained the power to license commercial operators to dispose of TRU wastes.

Who's in charge needs to be spelled in the pub. Just list the major actors and their major responsibilities. Not so much detail.



CUT BACK TO CHART

NARRATOR

In 1974, The Energy Reorganization Act abolished the AEC and brought into being the Nuclear Regulatory Commission (NRC) and the Energy Research and Development Administration (ERDA).

---

(20)

COLOR IN NRC

NARRATOR

In 1974, the NRC, an independent board which regulates all U.S. Commercial & nuclear activities was formed. It's an independent board whose members are appointed by the president.



CUT BACK TO CHART

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---

(20) COLOR IN NRC

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(20)

COLOR IN NRC

NARRATOR

In 1974, the NRC, an independent board which regulates all U.S. Commercial nuclear activities was formed. It's an independent board whose members are appointed by the president.

COLOR IN ERDA

NARRATOR

Between 1974 and 1977, the Energy Research and Development Administration was responsible for the nuclear research and development formerly handled by the AEC. This responsibility included weapons production and energy development.

CUT TO VTR SCENE #35

NARRATOR

ERDA and its prime contractors were exempted...with some exceptions...from NRC regulations to preserve national security. In 1977, ERDA was abolished as an independent agency and was absorbed onto the <sup>D</sup> <sup>O</sup> <sup>E</sup> department of energy.

CUT TO CHART OF FEDERAL AGENCIES; COLOR IN DOE

NARRATOR

The Department of Energy ~~was formed in 1977.~~ This agency was given the responsibility for nuclear research and development...this responsibility included the authority to conduct research necessary to policy-making where waste management, actual waste handling and storage of all defense wastes are concerned. This included disposal of commercial high level waste and/or spent fuel elements.

CUT TO VTR SCENE #36; KEY DOE DIVISIONS

NARRATOR

The Department of Energy's Waste Management Office includes a Division of Waste Isolation. This division selects sites; conducts research, development and demonstration work on a permanent repository.



(21) KEEP VTR SCENE #36; CONTINUE KEYS OF DIVISIONS

NARRATOR

Inside DOE, a Division of Waste Products is in charge of waste handling and processing facilities for all types of civilian and military waste, as well as decommissioning and decontamination work.

The Division of Fuel Storage and Transfer handles both interim storage facilities and availability of transportation systems.

WIPP is the part of the Projects Staff of the Waste Management Office. DOE has authority to regulate its temporary waste storage and treatment activities.

CUT TO CHART OF FEDERAL AGENCIES; COLOR IN EPA

NARRATOR

The final agency responsible for certain aspects of nuclear wastes programs is the Environmental Protection Agency... responsible for providing environmental radiation protection criteria and standards.

CUT TO VTR SCENE #37

NARRATOR

The question of nuclear wastes has become national concern. People are asking what policies should be made and who should make them...and these questions in themselves are becoming just as controversial as the issues involved in the whole area of nuclear wastes themselves.

CUT TO VTR SCENE #38

NARRATOR

To this point, Congress has exercised control over nuclear waste disposal only through appropriations.

In 1978, Congress turned down funding for DOE to license WIPP. This was an attempt to be sure that WIPP would be constructed and operated with strict Congressional approval. At present, however, it's still not sure that a license is needed and the Nuclear Regulatory Commission has yet to set criteria for such licenses.

OUT  
OF  
DATE

out of  
date



(22) CUT TO VTR SCENE #39; KEY 1979 & IRG CENTER SCREEN

NARRATOR

When President Carter set the National Energy Plan in motion, he ordered a review of U.S. Nuclear Waste Management. In 1979,

The Interagency Review Group on Nuclear Waste Management (the IRG) presented its report to the president.

*It has now*  
*See MB p. 39-43*  
Today, however, there are still questions and the IRG has made no recommendations for the establishment of an Administrative policy in respect to long-term management of nuclear wastes. Neither have recommendations been made of supporting programs to implement any policy.

CUT TO VTR SCENE #40, SPEAKER PRO IRG "MISMANAGEMENT CHARGES", NARRATOR VO FIRST FEW SE

NARRATOR

The IRG report says that for the past 30 years, management of radioactive wastes has experienced inadequate management of waste management research and development efforts with those for other parts of the nuclear fuel cycle. *awk.*

BRING UP AUDIO ON IRG SPEAKER, KEY NAME/TITLE/PART OF COUNTRY 6:00--7:00

CUT TO GRAPHIC QUESTION WHAT IS POLICY/OBJECTIVE ANYWAY?

NARRATOR VO

Perhaps the question should first be asked and answered: just what constitutes a basis for policy? What is the primary objective of waste management planning?

CUT TO VTR SCENE #41; KEY OBJECTIVE: AND DEFINITION

NARRATOR

The primary objective of waste management planning should be to isolate all nuclear wastes from the niosphere and see that they pose no significant threat to public health and safety.

CUT TO VTR SCENE #42

NARRATOR

Further, IRG states that the responsibility for the public health and safety as concerns nuclear wastes... is the responsibility of the present generation. We cannot defer it



23) CUT TO VTR SCENE #43, CROWD SCENE. KEY QUESTION: WHAT PART DOES CITIZEN PLAY, CENTER SCREEN.

NARRATOR

Precisely what is the role of the citizen in decision making on public issues...more specifically in the decision-making as far as the nuclear waste issue?

CUT TO VTR SCENE #44

NARRATOR

The issue of nuclear waste is a highly technical one. And.. while it is good when you..the average citizen can become informed on the technicalities involved...you probably don't have the time to delve into the finite points as the scientists do. So.. where can you do the most good?

*This is good,  
See also  
MB. P 46  
for  
process*

CUT TO VTR SCENE #45

NARRATOR

You can be most effective when you express your concern as citizen. To do that, naturally, you must be as informed as possible on the issue. You must stay aware and current with the steps, procedures and timetable planned for the decision process.

CUT TO GRAPHIC; SWITCH IN POINTS AS THEY ARE NAMED

NARRATOR

How can you best do this? Know which appointed and elected officials have responsibility in the entire process of nuclear waste.

Know when and how to express your views...and the most appropriate person to express them to. Write directly to federal officials involved, since the federal level is where many final decisions will be made.

KILL KEY "POINTS" AND KEY "OFFICES"

NARRATOR

Write to the Executive Office of Science and Technology and The Division of Energy Technology at DOE.



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NARRATOR

Write to the Executive Office of Science and Technology and  
The Division of Energy Technology at DOE.

Write to your representative in Congress.

(25) KILL "OFFICES" AND KEY "POINTS"

Take time to attend hearings, conferences, help attain media  
coverage and write letters to editors.

Be persistent. After all, this is still your country, and you  
have a right to have a say and a voice in what happens...but  
you must realize that things happen slowly...and you must be  
able to hold out for the duration..

FADE SLOWLY INTO END OF YARN AS HANDREACHES IN AND PICKS IT UP.

Once decisions are made, it's not the end of the line for your  
involvement as a citizen.

HANDS BEGIN TO REWIND YARN AS KITTEN REACHES UP AND TRIES TO GRAB STRANDS

You must continue to watch what happens, to monitor policy,  
to take an active part in implementation of public policy.

These things are all as important as the other steps leading to  
decisions. Only through watchfulness can you and other citizens  
assure yourselves that policies

FADE INTO LS WOMAN SITTING IN ROCKER, CAT ON LAP. SHE IS KNITTING. BEGIN  
SLOW IN AS SHE PUTS DOWN NEEDLES AND END WITH CU OF SWEATER.

NARRATOR

WILL ACHIEVE DESIRED ENDS...that intent and purpose will be  
realized.

BRING MUSIC UP

ROLL CREDITS ACROSS SWEATER TO BEGIN WITH. KEEP CREDITS ROLLING AS QUICK  
CUTS OF PREVIOUS SCENES SHOW ON SCREEN: BOMB, LABORATORIES, SPEAKERS, ETC.  
END FINAL CREDITS OVER KITTEN TANGLED IN BALL OF YARN.



(19)

CUT TO VTR SCENE #31

However...just how much these agreements, according to the Price-Anderson Act...will x cover have not yet been established by the agencies involved, and their specific action will be required to set such policy. Critics have raised legal questions on the issues of liability, exemptions and coverage, stating that problems are not as easily resolved as DOE indicates.

CUT TO VTR SCENE #32 (KEY NAME/TITLE/AREA OF PERSON) 5:00-6:00 ASSM WARNING

NARRATOR VO LAST FEW SECONDS

This leads us, quite naturally to ask the question: Just who is in charge of policy...who does assume responsibility in case something happens...and just what are the Federal agencies and state agencies involved in this whole thing?

CUT TO CHART OF FEDERAL AGENCIES

NARRATOR

There are..were...five primary agencies involved in regulation and establishment of policy as far as nuclear wastes are concerned.

ONE: The ATOMIC ENERGY COMMISSION (AEC)...an agency which had responsibility for u.s. nuclear activities from 1946 to 1974.

CUT TO VTR SCENE #33

NARRATOR

THE AEC had authority to license privately owned facilities to use nuclear materials. In 1962, the AEC initiated an AGREEMENT STATES PROGRAM which allowed states to make agreements with the Federal government to regulate all low level nuclear activities, including certain low level commercial burial grounds within their boundaries.

CUT TO VTR SCENE #34

NARRATOR

New Mexico became an agreement state in 1974, Texas in \_\_\_\_\_. But, the AEC retained the power to license commercial operators to dispose of TRU wastes.



## NARRATOR

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## COLOR IN ERDA

## NARRATOR

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BRING NARRATOR VO LAST FEW SECS OF VIDEO

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1

Hanna (Hanna Tx leg) 199

time:30

Shot  
of Bomb  
w/ Hanna  
V/O

The first time most of us heard about nuclear power was during the war, and it was a military secret that was developed for the military and the first that the general public, and I am certainly one of those, was the mushroom, where devastation killed thousands of people. I think that we've still got that image in our minds. Actually, nuclear power probably had the safest record of any energy we have.

nuclear defense is growing throughout the United States at an incredible rate. High level waste including the highly radioactive liquids and spent fuel rods from reactors has mounted to 70 million gallons of liquid and 5 thousand metric tons of used fuel element. Lower level waste, including work gloves and tools contaminated by use with radioactive equipment accounts for 66 million cubic feet--and there 155 million tons of radioactive tailings left at processing plants after some of the uranium has been extracted.

The states of Texas and New Mexico are being asked to take their share of this nuclear garbage, this radioactive debris. Some, including Governor Clements, say that Texas is being asked to take more than its fair share.

Governor Clements admits that he is willing for Texas to be responsible for the waste created within its boundaries ---almost all low level waste except for a small amount of defense high level waste created at Pantex, near Amarillo.

But Clements, and everyone else agrees they want the storage of that waste to be safe. What is safe, however, is not a matter which seems to be easily definable.



2

Some scientists claim that storage is not really a major problem

Gordon (MOBE 3) 320 time: 40

It's very difficult for me, as an engineer, to see where the problem is, because I can see all the experiments, experience that we've had in the past handling this materials. I mean, we've been handling this material for 40 years, and 40 years ago we might not have known what we were doing, and we set out standards too high, or radiation levels, but over a period of time, as we learned more and more about this material, we have set our standards tighter and we've had less exposure and less risk. It's to the point now that it is basically not a problem, and it is difficult for me to create a problem out of this area.

but they recognize that the public in general may see waste as a problem.

Rasmussen (Rasmussen) 231 time: 10

I personally ~~see~~ think that waste disposal is the least serious of all the risks facing nuclear power ...and as you correctly point out, the public perceives it as one of the worst. As an engineer, I see it as way down on the list of things of serious concern to us.

The reason many people see nuclear waste as a bigger problem than the kind of garbage they throw in their own dumpster and land fills--is that radioactivity has been linked to cancer. It can be deadly to humans if it gets into our land or water, into the biosphere/in sufficient quantities. And its ~~xxxxxxx~~ heat generating trash. The very reaction which makes the elements in fuel rods producing energy continues ~~xxxx~~ working for 500 years or so beyond the time it can be use in a reactor.

Because it's such a long term problem, ~~xxxxxxxxxxxx~~ ~~xxxxxxx~~ with potentially disastrous consequences...people want assurances of absolute safety. but they don't seem to trust anyone to give them those assurances. They don't trust scientists to tell the truth.

Krachener (Hannan) 172 time: 15

I'm not a nuclear physicist...and I have to count on these people and trust what they're saying. ..I don't do that now., But I do know that they're hauling in dangerous material and..and I think there could be ill effect to this town and community.



3

And they don't trust the government or any of the government agencies.

Rick Wilcox (Hannan) 355 time:27

Well, I think the entire history of the nuclear industry...which was so dramatically illustrated in three mile island: all of the cover ups, the failure to exchange information and so forth.. indicates that not only do the private nuclear power establishments but the so called regulatory commission that it works with...are a classic bureaucracy. THE NRC is not going to continue to exist if there is no nuke industry to regulate.. it's not going to regulate itself out of existence.

Cochran (#3 Hannon ethics) 214 time:35

The institutions are driven by pressure overriding priority which is insure the survivability of the nuclear option rather than the priority of insuring the health and safety of future generations by safely managing the program. Now, when those 2 priorities collide, organizations like the depart. of energy will make decisions based on...not on the appropriate waste form but on salvaging the nuclear power industry

Scientists say they don't really understand the reasoning behind their vehement critics.

Weart 406 time:18

I find it very difficult to disarm people's fears because most of their fears are not based upon technical fact, they're based on emotion. And emotion is a very difficult factor to deal with, particularly for the technical person like myself.

And they point to evidence they say shows nuclear waste can be safely, even beneficially, disposed of.

Gordon 222 (Mob survival #3) time:38

I think one of the ~~most~~ important things that you have to remember, the first thing that is said is "Ah, we don't know how to do it, we've never done it before." Well, that's wrong. If you consider that every time we've popped off one of our nuclear weapons underground, we've officially disposed of some nuclear waste. I mean, we dug a hole, a couple of thousand feet down, we put a nuclear weapon down there--we've popped it off. Now, we didn't go to the effort of gathering up that waste and putting it in a nice solidified form, and you know, stacking it here and there. We just left it, and all we did, was we made sure that we put it in a fairly stable formation before we popped ~~xxxxxx~~ the weapon off. Now, you go back 20 years later, and you look down there

and you'll find there hasn't been any appreciable movement of nuclear waste.



4  
Gordon 267

(MOSE 3)

time: 25

So effectively, in a way, we're actually cleaning up the environment. What we're doing is we're going down to Texas, south Texas, , gathering this radioactive material ... putting it in a power plant and using it, getting useful energy out of it, taking the remaining radioactive material and putting it 3-thousand feet down, completely out of the environment. So actually, over a period of a couple of thousand years of our activities, we may be cleaning up the environment appreciable..

Profound and deepseated as the disagreements are in general discussion of waste disposal--they come nowhere near matching the intensity of people who live near a potential disposal site.

Such a group is located in Carlsbad, New Mexico. The government has proposed siting a storage facility in the underground salt deposits there, and has spent millions of dollars and years ~~xxxxxx~~ researching the practicality of the site. Researchers say salt is an excellent medium for storing nuclear waste: there is little water which could carry radioactivity to the surface--water would have dissolved the salt. Salt is fairly stable, and cracks <sup>in the presence of heat,</sup> and fissures usually heal themselves.

Opponents of the site say that salt is not the ideal medium. They claim there are other better--others located far away from Carlsbad, New Mexico

Nathanson (SW research ) 409 time: 26

I think that~~x~~ they have chosen New Mexico because it was politically expedient viable...because New Mexico has a small congressional delegation...because 58 percent of the population is people of color. because they didn't feel they could put it anywhere else. because ~~xx~~ 11 other states have said no in one way or another and there are a number of states who are considering saying no in one way or another. and I think they chose New Mexico because they thought it was going to be a pushover.

The plan now in the works calls for an experimental nuclear waste storage facility, WIPP--the Waste Isolation Pilot Project. And researchers say that there won't really be any effects on the area from radioactivity--just new business for the community .



8  
Weart 182 time: 52

In general we find that the impacts which will be greatest and which really are unavoidable are those involving the construction of the facility itself. The necessity of providing routes for roads, power lines water lines, entail environmental impacts. The disturbance of the surface, the mining of the salt and placing it on the surface are the major environmental impacts. The impacts due to normal operations and the fact that you are dealing with radioactive materials is ver insignificant. partly because we expect all these materials to come to wipp packaged and sealed in containers and so they'll never be exposed to the air or to the environment.

about

Local opinion ~~xxxxxx~~ the plant is highly emotional.

Townfathers argue hometown economics....

Mayor  
Jerrells (Hannan) 149 time:32

We feel like that number one the dollar impact will be significant in an area our area which our economy is based on extractive industry nearly totally. We feel, number two, it serves a need a need in the nuclear industry picture that New Mexico historically has been in the forefront of.

and they argue for the national good.

Carlsbad #2

264

*biz man*  
we feel that, if in the opinion of the experts, that this is the place that ~~was~~ be best suited, then this is an opportunity for the citizens of carlsbad to serve their state and nation by taking the lead and welcoming the government to Carlsbad to solve a problem that has plagued our nation for some 35 years. <sup>20</sup>

and they condemn the ~~no~~ would condemn they for supporting WIPP

and they want to get on with it.

Carlsbad #4 147 time:

We feel that a project such as WIPP is infinitely preferable to widely scattered shallow burial pits that we presently have all over the nation. We are in favor of WIPP.

And speaking for myself I'm appalled ~~that~~, absolutely appalled to think it's been 20 years have gone by since the burial in salt was first proposed. and we're no further than we are here today...we're still bickering...we're still fighting.



6  
But opponents are indeed still fighting...with everything  
at their command...from emotion ~~xxxxxxxxxx~~

Carlsbad 4 240 time:

Then people in this state have a moral responsibility  
to their children and their grandparents who have  
worked, sweated and ~~xxxxxx~~ toiled for the betterment  
of your children. If there's an accident there has  
to be a reason why no other state in this country  
and why foreign governments will not take nuclear  
waste. (:23)

(wild eyed type)

Time: 04'  
We may be planting a time bomb in Carlsbad.  
(grace mother)

Pregnant woman 203 time:

We New Mexicans who voice our opposition to the  
outrage the DOE called the Waste Isolation  
Pilot (?) Plant will not be deterred, will not  
tire, will not give up until the DOE realize that  
we are speaking for the majority of New Mexicans.  
The DOE (applause) The DOE shall be convinced  
to leave New Mexico...dragging their deadly radio-  
active wastes with them. (applause) 30

To economic arguments of their own...for the present and  
the future.

Nathanson (SE Research) 190 time: 32

I'm also concerned that that there's a billion  
dollars worth of potash under the site. and  
one of the original criteria for citing radioactive  
waste was there should be no major conflict with  
valuable resources. All of the sudden there's  
a billion dollars worth of very valuable potash  
...the rarest form called langonite for citrus  
and tobacco crops...and also up to 62 billion  
cubic feet of natural gas underneath the site  
and suddenly that criteria gets forgotten.

? marked poll 65 time: 33

~~xxxxxx~~ The overriding objection to salt is  
that it is a natural resource. And not only is it  
a resource in itself but it comes together with  
even more attractive resources like potassium salts,  
~~pot~~ potash or oil and gas. and the problem that I  
foresee is that we'll be unable to communicate with  
to our descendants that there is something that is  
obviously attractive from the point of view of a  
resource but yet its a no-no. They aren't supposed  
to dig in there.

Nor are the people in New Mexico alone in opposition to  
a nuclear waste storage facility. It appears that no  
matter where a location is proposed, violent and  
emotional disagreements arise.



1  
salt bearing  
another/site near Canyon Texas is being tested to determine  
whether or not it could serve as a storage facility.

what experts see as an advantage, opponents see  
as a terrifying danger.

#### TX WATER

Fisher and Wermund (27 285 time:12

We're looking at depths on down to about 4 thousand  
feet, and the Ogallala and your...and your ground  
water aquifers are much higher up. The depth  
is what...about a thousand feet so...

#### ANTI CANYON FACILITY

Rick Wilcox (hannan) 209 time:36

As you're well aware in this part of the world,  
our public health..public water supplies  
come from the Ogallala aquifer and some deeper  
aquifers. Those could, if the DOE goes ahead with  
the waste dump plans as outlined...would be above  
the waste dump. And there's a very serious possibility  
I think with the kind of heat build up they're  
talking about in a waste dump...something in the  
order of 300 degrees celsius that you could have  
fissures open up from the heat and pressure  
and get the public water supplies contaminated  
or even worse have them seep into the burial  
chamber, turn to steam and have them give you some  
kind of significant cataclysm.

~~This same disagreement and dichotomy of opinion exists~~  
~~on almost every facet of nuclear materials~~ Even  
those who live nowhere near proposed site object  
to a nuclear storage development because the waste will  
have to be transported there. Scientists say transportation  
is incredible safe, and they cite statistics to prove  
it

Dr Foster (Dr. Foster 2)

time: 37

You have to realize that we have been transporting  
this material almost as long as we've been producing  
it. At this point we've racked up about 4 and a  
million miles of transportation of nuclear waste...  
most of that by truck. In all that time, we've  
never had what the department of transportation  
refers to as type b containers...that is accident  
resistant containers. We have never had nuclear  
materials leak as a result of an accident from  
one of these type b containers.

and they bring up trust.

DR. (Weart II) 379 time:10

At some point in time you have to trust somebody  
and I think in general, in the area of transportation  
in particular, the government has a good track record  
of telling the truth.



But the public, exposed to doubts from every side, seems unwilling to trust anyone.

Fr. Michael H'milton (ethics wkshp) 356 time: 20

I'm frightened again...the public is frightened because when some of the things ~~xxxx~~ that transport mobile homes across the state of New Mexico, innocently with a wide load on them sign...are really, apparently according to a recent New York Times thing...are really carrying nuclear material within them...hidden and deception.

the problem of nuclear debris  
Perhaps in the final analysis, ~~xx~~ comes down to trust.

The belief that our scientists and those who govern us are still people who will not willingly choose to deliberately destroy those they serve.

continue to make accusations of the greedy businessman...I take exception and feel I know most of the supporters of this project here in Carlsbad and I've known them as long as anyone, having lived here for 29 1/2 years. <sup>36</sup> That to accuse these men, myself included, of being willing to sacrifice the safety of another human being for a dollar is completely out of line. <sup>47</sup> Most of these people have children and/or grandchildren either living in Carlsbad or visiting Carlsbad on occasion... And believe me, no one in their right mind ~~xxxx~~ is willing to put the safety of his loved ones in jeopardy for a dollar bill. <sup>107</sup>

It's the policy of the government ~~operation~~ the public and those people that make up ~~the~~ the government...like myself and the people who work in my office all have their own families and children here in the state and across the country and they're not about to compromise their future or any immediate future...so we're going to be safe.

What may be terrifying people is that it is a bigger, more long term problem than they have ever been called upon to deal with before, and they want to try to deal with it in normal ways.: insisting on states rights

Keesee 100 (TX legis-Keese) time:10

Yes I think that the state, particularly the state of Texas, or any state, should have control over, and as much control as possible, over its environment.

and yet admitting that the states might not be the best ones to deal with the problem

X Cochran (ethics workshop) 90 time: 07

You really ought to be looking for the best site, and not people running around vetoing particular areas of the country simply because they don't



Trying to use normal political processes for something

be

Father Michael Hamilton (ethics workshop) x 322 time

The novelty of having to think of a plan, political and ethical, that has to consider a thousand years ahead before it's, in a sense, finished. and unfortunately the political process is geared to short term decisions...why? because the politicians have to be re-elected within a relatively short period of time. And they're re-elected by people who are not themselves going to live for a thousand years and whose love extends to their children, their grandchildren but it's pretty hazy beyond that. I think they've got a lot of public ed. to be done. I think the sense of goodwill is really being tested. I mean how valuable do we think our descendents really are? 500-600 or even 200 years from the time we live.

weighting benefits and risks.



Late feed - no tech capabilities  
for taking it live

cut down package from over  
2 to 1:15



*- self preservation*

## Preliminary Script Development

### I Establish reality of Radioactivity

#### Pervasive

Cosmic bombardment (background levels)

Safe to dangerous

#### Beneficial effects

essential for life

used as tool - research, medical

#### Summary:

radiation represents life and power. It is something we live with  
and cannot live without -- OR CAN WE

### II OR CAN WE

Anti Nuclear demonstrations

Nuclear energy has generated a lot more than power:

Plant 30 years

waste: defense, commercial

international waste

nuclear power stall (moratorium on plant construction,

licensing,

reprocessing

escalation/cost overruns

legislation stepping stones/stumbling blocks

mill tailings FED

domain STATES

accidents (WASTE)

Hanford, Rocky Flats, Silkwood, ~~Cancer-rates~~

Public fears (hiroshima, health effects, destruction or degradation of  
biosphere, land values, genetics, terrorism, transport

Health

Safety

Political Credibility

Costs

research/development -- technical and social  
storage

NO--permanent disposal so far

interim means - steel tanks

WIPP

waste forms --glass, ceramic, calcine, clay, obsidian, tektite

waste hosts --salt, basalt, granite, tuff, shale, outer space, deep ocean,  
sun

retrievability

reprocessing

incineration

containers (super tiger)

transportation

social: public acceptance polls



III SHOULD WE TRY to live without it  
The critics power solution  
question of funding priorities  
other energy options

effects of phasing our nuclear energy --  
how: to live without it  
how: to live with it

why: as interim solution  
may be no other power available in time  
defense"you will always have with you"

WIPP  
LOFT

public hearings-  
Carlsbad mayor/site  
anti- demonstrations

INCOMPLETE



Nobody likes to talk about garbage--especially their own... So it's not surprise that we didn't hear much about radioactive waste for so many years. Back then, it wasn't considered a problem. There was too little of it around to spend money on. Besides the public didn't know much about radioactivity, we tended to associate it with atomic fallout and cancers, and the less we heard about that the better.

So we didn't hear much about nuclear waste for over 30 years...until the volumes started getting to big to handle. The problem was getting out of hand, and it could no longer be safely ignored.

We started hearing reports about "leaks", and spills, and emissions, and it made us nervous.

The reports said that over the past 20 years nearly half a million gallons of high level waste sludge had leaked in the soil from cracks in 18 of the 149 underground steel storage tanks at Richland, Washington. It is still leaking. At Savannah River, South Carolina, about a hundred gallons of highly toxic wastes had leaked from stainless steel tanks encased in concrete vaults. The report said, "Liquids would be absorbed into the soil or diluted many orders of magintude



by the on-site creeks and swamps and by the Savannah River before reaching drinking water users."

We heard that for 20 years the government had dumped at sea nearly 50 thousand steel drums of low concentrations of radionuclide contaminated materials such as contaminated equipment or clothing. A third of these drums are now leaking into the San Francisco area Bay.

Low level wastes have also been buried in shallow land pits around the nation. An estimated 13 million cubic feet of these wastes are now lying in shallow graves. But several sites are located in areas of heavy rainfall, resulting in radioactive materials migrating away from their burial sites and contaminating soil and nearby streams. A report of contaminated wheelbarrows, gloves and shovels at an unmarked n-waste burial site in Nevada said that unsuspecting local residents discovered and dug them up for use. Radioactive particles from these low level sites were also discovered to be re-concentrating in the animal populace near Hanford, Washington. A study there traced radioactive waste materials found in a coyote feces and in the bones of dead hawks, back to radioactive jackrabbits they had apparently eaten. The jackrabbits were believed to have burrowed in near the waste trenches.



And there were still more stories of neglected nuclear waste materials, at abandoned uranium mining operations. Mill tailings, the radioactive leftovers of uranium mining are piled up over New Mexico, Colorado, Wyoming and Utah. The figure is about 27 tons of tailings emitting radon gas. It has leached into the subsoils, been blown onto grazing lands and begun seeping into the groundwater. Recent reports confirm that during the 60's construction firms were granted permission by the then Atomic Energy Commission to mix tailings into the foundations of homes, schools, churches, buildings, and streets in several states. These populations of these towns were exposed to radon levels seven times greater than that allowed for uranium miners.

One of the worst spills of radioactivity in US history occurred in July of 1979 at a uranium mine and mill in eastern New Mexico. Eleven hundred tons of a muddy mix of mill tailing waste material stored behind an earthen dam poured through a crack and into a small stream for an hour before workmen could stop it. Traces of the spill were later found as far as 75 miles away across the Arizona border.

We began to take stock in our nuclear waste stockpiles being generated by the weapons program and our commercial nuclear power production.



It was

The volumes of waste were substantial. 70 million gallons of highly radioactive liquids and 5 thousand metric tons of used commercial nuclear reactor fuel rods; 66 million cubic feet of slightly radioactive low level wastes such as contaminated work gloves and tools, and 155 million tons of radioactive uranium mill tailings left over from the mining and processing. The majority of these wastes are extremely hot, highly penetrating, toxic and very long lived.

Eventually we realized that we had allowed our air, our land, our foodchain, even our water and probably our bodies to be contaminated with concentrations of highly toxic radioactive materials.

We are now faced with a national problem: cleaning up after 40 years of splitting the atom.

Safety was now our major concern, but ironically it also seems to be the cause of our delay in solving the problem.

We want a safe, permanent, and failsafe place to isolate the wastes without risking contamination of our biosphere. Problem is, we don't agree on how safe is safe enough. In other words, what is an acceptable risk.

Some folks say there is no acceptable risk, because there is no safe dosage of radiation exposure.



Others say the question of risks is a question of weighing the benefits and alternatives in a no-risk-free world.

So we continue to debate and delay over often obscure social questions, over conflicting technical opinion, and over the politics of policymaking.

What is at stake in this argument over the best course of action? Perhaps the future of the nuclear power ~~industry~~ itself.

The volume of nuclear wastes continues to mount... During the last 35 years military activities generated the greatest volume of wastes. Now commercial wastes begin to rival at least in radiation content.

There are 72 nuclear power plants now operating and another 92 under construction. Their nuclear fuel rods represent some of the hottest wastes we must handle. About one third of the rods in a reactor core must be replaced ~~and stored~~ each year of plant operation. The cooling ponds where spent fuel rods are stored are reaching capacity at most plants. Unless we can provide interim or permanent storage for spent fuel within the next decade, several plants could be forced to shut down.



And we have deliberately strapped the future of nuclear power to the question of waste. The states of California, Wisconsin, Maine and Iowa have passed laws stopping all nuclear power plant construction until a safe, permanent waste storage solution can be demonstrated. Several other states have curtailed the expansion of existing nuclear waste storage facilities for the same reason.



## SALT

? Marked poll 65 time: 33

~~Exxxxxx~~ The overriding objection to salt is that it is a natural resource. And not only is it a resource in itself but it comes together with even more attractive resources like potassium salts, ~~pot~~ potash or oil and gas. and the problem that I foresee is that we'll be unable to communicate with- to our descendents that there is something that is obviously attractive from the point of view of a resource but yet it's a no-no. They aren't supposed to dig in there.

## /SITING

Lash (Las interview) 262 time: 27

Well, I think the biggest incentive for getting a state or a locality to accept the waste repository site is to have it be a scientifically sound proposal. And that's something that hasn't occurred yet. In each instance, where they've proposed repositories there have been serious technical flaws in the proposal, and therefore the people who would have to put up with the consequence have been very unhappy.

## SCIENTIFIC RESEARCH WIPP

Weart 146 time:29

We've been doing ex-expensive and extensive studies in southeast New Mexico for the last three years, trying to ascertain all the information about the geology and the hydrology of .. in other words how the earth and the water in the general area of the WIPP site behave. How they've behaved in the past, how they exist today, and how they might affect things in the future.

## STATE'S RIGHTS

Weart 87 (II) time:30

It is a serious political problem in this country, I believe, to find good sound sites for the disposal of nuclear waste which are also acceptable to the states and to the people surrounding the sites in the states involved. It's a very important problem. one, which, I think, will have to be solved between states and the federal government before we do find a solution to the waste disposal problem.



## STATE RIGHTS

X Cochran (ethics workshop) 98 time: 07

You really ought to be looking for the best site, and not people running around vetoing particular areas of the country simply because they don't want the waste.

## STATES RIGHTS ~~XXXXXXXXXX~~

Keesee 100 (TX legis-Keese) time:10

Yes I think that the state, particularly the state of Texas, or any state, should have control over, and as much control as possible, over its environment.

## TRANSPORTATION

Dr. (Weart II) 211 time:35

The second thing is that all of these packages have to provide four things. They have to provide a containment for the material you're shipping, so that it doesn't inadvertently get out into the atmosphere, they have to provide shielding if shielding is needed, they have to provide heat management if heat management is required, and they have to provide for prevention of accidental criticality if you're moving materials which could become critical. Now for most of the packages that are involved, the only thing that is involved is containment.

## PROBLEMS WITH INSTITUTIONS

Cochran a(4) 235 time: 22

The interagency review report it pointed out, and I concur with this, that the institutional problems are equally as important as the technical problems. If you have institutional failure, you can make bad technical mistakes...



## GOVERNMENT INACTION

Dr. Foster (Dr. Foster 2) 88 time:42

I think I would have to say the government has been, at least marginally negligent. It's a matter of priorities. The government has limited amount of money and an enormous amount of things it would like to do. and this is perfectly true that the disposal of nuclear waste has been low oneverybody's priority for a long time. The result is that we're now and I have to guess because I've never sat down and tried to quantify it...we're maybe 80 or 90 percent through the research and development necessary to conduct actual disposal of waste.

## TRANSPORTATION

LDr (Weart II) 346 time :12

We encounter radiation in every walk of life in normal circumstances and the amount of radiation contributed to that inventory by the shipment of radioactive waste is inconsequential.

PRO

## TRANSPORTATION

Dr. (Weart II) 301 time:20

The route is chosen by the shipper, and the shipper is a commercial outfit and under the federal regulations he can choose whatever route is optimum for his use. Now he's going to choose routes which allow him to move the material first of all in an expeditious manner and secondly to where he's going most the time in the shortest distance.

306 time:

The actual highway chosen will probably be the better interstates because he can move it with less delays... not at any higher speed necessarily but simply with less delays

## PUBLIC PRESSURE

Cohen 333 (#4) time: 15

The government does not try to optimize expenditures of money for human health and safety. They temper these judgements by the public concern on the problem...and that's nuclear situation is the extreme...the extreme example of that situation.

PRO



GOVERNMENT TRUST - *Trans*

DR. (Weart II) 379 time:10

At some point in time you have to trust somebody and I think in general, in the area of transportation in particular, the government has a good track record of telling the truth.

TRANSPORTATION

Dr Foster (Dr. Foster 2)

time: 37

You have to realize that we have been transporting this material almost as long as we've been producing it. At this point we've racked up about 4 and a  $\frac{1}{2}$  million miles of transportation of nuclear waste... most of it that by truck. In all that time (we've never had what the department of transportation refers to as type b containers... that is accident resistant containers). We have never had nuclear materials leak as a result of an accident from one of these type b containers.

*PRO*  
NUKE NOT A PROBLEM

Gordon (MOSE 3) 320 time: 40

It's very difficult for me, as an engineer, to see where the problem is, because I can see all the experiments, experience that we've had in the past handling this materials. I mean, we've been handling this material for 40 years, and 40 years ago we might not have known what we were doing, and we set out standards too high, or radiation levels, but over a period of time, as we learned more and more about this material, we have set our standards tighter and we've had less exposure and less risk. It's to the point now that it is basically not a problem, and it is difficult for me to create a problem out of this area.

*PRO*  
BOMB IMAGE

Hanna (Hanna Tx leg) 182

time:30

The first time most of us heard about nuclear power was during the war, and it was a military secret that was developed for the military and the first that the general public, and I am certainly one of those, was the mushroom, where devastation killed thousands of people. I think that we've still got that image in our minds. Actually, nuclear power probably has the safest record of any energy we have.



# EMOTIONS AGAINST NUKE WASTE BOMB IMAGE

Weart 406 time:18

I find it very difficult to disarm people's fears because most of their fears are not based upon technical fact, they're based on emotion. And emotion is a very difficult factor to deal with, particularly for the technical person like myself.  
415--time: 37

The things that we perceive as being the real issue are often not the things the public perceives as being the ~~major~~ problem. The general public often views anything associated with the words radioactive or nuclear as conjuring up in their minds a catastrophic event...like Hiroshima or Nagasaki. It's difficult of them to conceive of a nuclear accident perhaps as being a very small and innocuous occurrence rather than being a catastrophe.

# WIPP IMPACT SITE

Weart 182 time: 52

In general we find that the impacts which will be greatest and which really are unavoidable are those involving the construction of the facility itself. The necessity of providing routes for roads, power lines water lines, entail environmental impacts. The disturbance of the surface, the mining of the salt and placing it on the surface are the major environmental impacts. The impacts due to normal operations and the fact that you are dealing with radioactive materials is very insignificant. partly because we expect all these materials to come to WIPP packaged and sealed in containers and so they'll never be exposed to the air or to the environment.

PRO

PRO WIPP

Mayor  
Jerrells (Hannan) 149 time:32

We feel like that number one the dollar impact will be significant in an area our area which our economy is based on ~~extractive~~ industry nearly totally. We feel, number two, it serves a need a need in the nuclear industry picture that New Mexico historically has been in the forefront of.

164 time: 18  
As long as there's no harm to the environment or the people of the area as indicated by the scientific study and all the environmental impact statements that must be completed...and we had no objection to the project.

# NUCLEAR ACCIDENTS WIPP

PRO

Weart 204 time: 23

One of the things that we do have to look at, of course, in this impact statement, are the impacts of accidents. What we call "worst credible accidents," that could occur. And in looking at these, we also find that the radiation impacts, even from accidents are relatively inconsequential.

213 time: 35  
(partly because it's solid encapsulated in a solid material and then that is all packed inside a strong safe container and all the operations of handling, transferring the waste and moving it underground are done inside of buildings which are sealed. So even if an accident occurred during the handling it would be contained within the building. these are some of the reasons why the expected impacts, even from an accident, would be very small.



PRO WIPP

Carlsbad #4 147 time:

We feel that a project such as WIPP is infinitely preferable to widely scattered shallow burial pits that we presently have all over this nation. We are in favor of WIPP. V

And speaking for myself I'm appalled that, absolutely appalled to think it's been 20 years have gone by since the burial in salt was first proposed. and we're no further than we are here today...we're still bickering...we're still fighting. 31

PRO WIPP

Carlsbad #2

70 biz man Time: 48

~~People-in-Santa Fe~~ People-in-Santa Fe It's a problem that's got to be solved...it's a problem that's not going to go away...which made us even more think and advocate that low level transuranic or nuclear waste can be safely isolate, we need to do it. If it can't be done here, we need to do it here...if it can't be done here, we need to do it somewhere else so we're addressing the problem that has to be answered. <sup>30</sup>They attacked us in Santa Fe on the fact that it will ruin the tourist industry in Carlsbad. The tourist people in Carlsbad are for the project and so testified in hearings at Santa Fe.

TAILINGS

265

Cochran (Hannon ethics) XXX time: 37

The fairest allocation of the benefits and the risks when you when those people are not there to voice their preference is to be neutral to those people...so the benefits and risks are neutral...so to be neutral to future generations implies that their risks from activities related to the processing and use of uranium and production of waste are no more than they would have been if we'd left the uranium ore bodies in place.



## ARC REGS ON SITE

Major #337 (denver) time:52

The licensing procedures that we're proposing are similar to those used for nuclear reactors in that they have 3 parts. First, a review of an application by the department of energy by the Commission in which we do a safety analysis and an environmental review and issue an authorization to construct a repository. Subsequent to that, after the repository is constructed and tests have been run, there is an updated safety review and another environmental analysis before authorization is given to put nuclear waste in the repository. and then later, after the repository has been developed and waste has been put in in a retrievable mode for a number of years... DOE would come to the commission and ask for authorization to close the repository and to keep

the waste in the repository in an irretrievable mode.

## NUKE ISSUES

Lash (Lash interview) 49 time:

There are two major issues that the public must play a role. One is the future of nuclear power as it relates to the generation of radioactive waste. And I think this is the principle issue now facing nuclear power. Should we continue to generate power with electricity with nuclear power plants when we don't have a waste disposal facility available for getting rid of these wastes. <sup>24</sup> and I think that the licensing of nuclear power plants should be tied...and depend upon... rapid progress in building a repository that will safely contain these wastes over thousands and thousands of years. <sup>39</sup>

The second major area where the public has a major

role to play concerns the siting of such repositories. <sup>45</sup> In the past, the federal government has not paid much attention to the concerns of state governments, local governments, and the general citizenry in the states where repositories might be located. <sup>110</sup> That resulted, for instance, in the federal government having to abandon a proposed repository in Lyons, Kansas. <sup>110</sup> Had they sought out the advice of local scientists, and citizens at an earlier stage they would have found that site was not acceptable and for good reasons and they could have saved a lot of time and money. <sup>122</sup>



## NUCLEAR WAPON TESTING

Gordon 222 (Mob survival #3) time: 38

I think one of the ~~mas~~ important things that you have to remember, the first thing that is said is "Aw, we don't know how to do it, we've never done it before." Well, that's wrong. If you consider that every time we've popped off one of our nuclear weapons underground, we've officially disposed of some nuclear waste. I mean, we dug a hole, a couple of thousand feet down, we put a nuclear wapon down there--we've popped it off. Now, we didn't go to the effort of gathering up that waste and putting it in a nice solidified form, and you know, stacking it here and there. We just left it, and all we did, was we made sure that we put it in a fairly stable formation before we popped ~~it~~ the weapon off. Now, you go back 20 years

later, and you lookd down there and you'll find that there hasn't been any appreciable movement of that nuclear waste.

## PRO WIPP

Carlsbad #2

264 *biz man*

we feel that, if in the opinion of the experts, that this is the ~~place~~ *place* that ~~could~~ be best suited, then this is an opportunity for the citizens of carlsbad to serve their state and nation by taking the lead and welcoming the government to Carlsbad to solve a problem that has plagued our nation for some 35 years. <sup>20</sup> For those who continue to make accusations of the greedy businessman ... I take exception and feel I know most of the supporters of this project here in Carlsbad and I've known them as long as anyone, having lived here for 29 <sup>28</sup> years. That to accuse these men, myself included, of being willing to sacrifice the safety of another human being for a dollar is completely

out of line. <sup>49</sup> Most of these people have children and/or grandchildren, either living in Carlsbad or visiting Carlsbad on occasion... And beleive me, no one in their right mind ~~would~~ is willing to put the safety of his loved ones in jeopardy for a dollar bill. <sup>157</sup>



TIME

Cohen (#4) <sup>250</sup>~~242~~ time:

The point is that after about 500 years this material is not very toxic. For example, ~~gxt~~ if we consider the material generated by all nuclear power systems in the united states the tototoxicity of 500 year old waste is 1000 times less than the toxicity of arsenic.

GOVERNMENT

D.T. Scheuler (Scheuler 2) 353 time:20

It's the policy of the government to protevt the public and those people that make up ~~the~~ the government...I like myself and they people who work in my office all have their own families and children here in the state and across the country and they're not about to compromise their future ot any ~~mor~~ immediate future...so we're going to be safe.

LUKE 3000 FOR ENVIRONMENT

Gordon 267 (MOBE 3)

time: 25

PRD

So effectively, in a way, we're actually cleaning up the environment. What we're doing is we're going down to Texas, south Texas, gathering this radioactive material ... putting it in a power plant and using it, getting useful energy out of it, taking the remaining radioactive material and putting it 3-thousand feet down, completely out of the environment So actually, over a period of a couple of thousand years of our activities, we may be cleaning up the environment appreciable..

TX WATER

Fisher and Wermund (27 285 time:12

we're looking at depths on down to about 4 thousand feet, and the Ogallala ~~and~~ your...and your ground water aquifers are much higher up. The depth is what...about a thousand feet so...

PRD



TIME

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LUKE GOOD FOR ENVIRONMENT

*PLE*

Gordon 217 (MOGE 3)

time: 25

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TX WATER

*PLE*

Fisher and Wermund (27 265 time:12

We're looking at depths on down to about 4 thousand feet, and the Ogallala and your...and your ground water aquifers are much higher up. The depth is what...about a thousand feet so...



CH

I'm frightened again...the public is frightened because when some of the things ~~xxxx~~ that transport mobile homes across the state of New Mexico, innocently with a wide load on them sign...are really, apparently according to a recent New York Times thing...are really carrying nuclear material within them...hidden and deception.

CH

I'm concerned about the fact that the big expensive crash test that you may or may not have seen at 81 miles an hour are not going to be the containers that are going to be transporting the waste through New Mexico. I'm concerned that there are going to be five trucks and 5 train carloads coming through New Mexico every day for 20 years with over 60-thousand shipments. Now I can't believe that there's not going to be an accident.

CH

Well, people are just not willing to have nuclear waste in their backyard and rightly so. But at some point we have to take a position; you know to be responsible.

CH

Thinking the public is very frightened of accidents. There's been enough in spite of assurance of safety by people like you. There has been a number of unexpected and rather frightening accidents.



## INSTITUTION PRESSURE

Cochran (#3 Hannon ethics) 214 time:35

The institutions are driven by pressure overriding priority which is insure the survivability of the nuclear option rather than the priority of insuring the health and safety of future generations, by safely managing the program. Now, when those 2 priorities collide, organizations like the depart. of energy will make decisions based on...not on the appropriate waste form but on salvaging the nuclear power industry

## GOVERNMENT LIES

Rick Wilcox (Hannan) 355 time:27

Well, I think the entire history of the nuclear industry..which was so dramatically illustrated in three mile island:all of the cover ups, the failure to exchange information and so forth.. indicates that not only do the private nuclear power establishments but the so called regulatory commission that it works with...are a classic bureaucracy. THE NRC is not going to continue to exist if there is no nuke industry to regulate.. it's not going to regulate itself out of existence.

## POLITICAL EXPEDIENCE

Lathanson (SWResearch) 206 time: 06

It seems to me that ~~there's~~ again, there's politically expedience being dealt with instead of scientific fact. ~~They've continually have gone around the state-telling~~

## SCIENTISTS VS CITIZENS

Lynn (Mobe 3) 86 time:20

I'm concerned that the other side is represented you know, during office hours in their business suits, in their well financed jobs and (Guy walks into picture and fusses with mike) to many people that seems more credible than an ~~an~~ for..to take ~~take~~ information from them than it does groups who are doing it on their off time.



## TEXAS PROJECT

Fisher and Wermund (2)160 time:22

The level we are at now is...is feasibility studies. And I can assure anyone that there will not be any recommendation for waste being stored there or anyplace else in the state of Texas that we have anything to do with... unless we were 100 percent sure that it would be safe. And we're in no position to say that now. We don't know that yet.

## BREEDER REACTOR

Lash (Lash interview) 219 time: 38

Increased and continued dependence on nuclear power means we will have to have re-processing and breeder reactors in the future because there's a very limited amount of uranium resources in the world. If we have re-processing and breeder reactors that means there will be a lot of purified plutonium available for use in weapons by terrorist groups, sub-national organizations such as the PLO or by other countries, so that there would be a proliferation of countries in the world that have a nuclear weapons capability.

## TAILINGS

Dr. Graham Foster (D.T. Scheuler 1) (XXXXXX) 80 time: 37

When uranium ore is taken out of the ground and sent to the mill, something like 80 percent of all the radioactivity that was in the ore originally is left behind in the tailings. And the 20 percent that is left over the uranium that goes into fuel elements and goes into the reactor and as it is reprocessed, it comes out the other end as extremely radioactive high level waste. After 250 years of decay the high level waste has less biological hazard left in it than the tailings that were left behind at ~~the~~ the mill.

## ANTI CANYON FACILITY

Rick Wilcox (hannan) 209 time:36

As you're well aware in this part of the world, our public health...public water supplies come from the Ogallala aquifer and some deeper aquifers. Those could, if the DOE goes ahead with the waste dump plans as outlined...would be above the waste dump. And there's a very serious possibility I think with the kind of heat build up they're talking about in a waste dump...something in the order of 300 degrees celsius that you could have fissures open up from the heat and pressure and get the public water supplies contaminated or even worse have them seep into the burial chamber, turn to steam and have them give you some kind of significant cataclysm.

CON



## PROBLEM OF WASTE DISPOSAL

Lash (Lash interview) 237 time: 30

Then we also have this problem of waste disposal. I'm hopeful that we can ~~find~~ find a satisfactory way of disposing of existing waste, but given the extreme difficulty in so far in fact the impossibility of finding a single site for safely disposing of waste...I think it's unlikely that in the coming decades we'll be able to find many---a dozen, two dozen, three dozen sites for disposal with increasing amounts of radioactive waste.

250 I think the WIPP site is ill considered and undesirable and in fact we won't have it. And I think it's too bad we continue to spend tens of

millions of dollars on a undesirable facility. 14

## PUBLIC HEARING RESPONSE

Nathanson (SW research) 289 time: 35

Question:

The public in its first round of hearings spoke a lot about its concern for transportation and now they have division of transportation and there was concern about envitrified glass and now there is where that had been at one time considered the form it would take..now they're looking at other forms. Do you believe its because of citizen action such as yours that this is being done?

Soure, sure I beleive that definitely is the case. What I'm concerned about though isa that research becomes window dressing. I don't want it to be window dressing...I want it to be research.

I want them to make sure when they find the site that its the best site.



ANTI WIPP

carlsbad #2 173 woman time: 07

significant numbers of people whose lives will be most affected by its placement, do not want WIPP as a neighbor. 8 (Carlsbad nuclear waste forum)

WIPP SALT

Cochran (#4 Cochran) 47 time:15

One of the technical discussion we heard the other day was ~~that-you're-okay~~ if you put spent fuel in salt, you're okay unless you get water in the repository, in which case you've got a real mess.

146 time: 32

In the US case there's a lot of emphasis on the wipp site. There are potzsh deposits associated with that site...sub economic resources that may be economic in the future..there's a high probability of future human activities in that area..oil and gas resources and so forth. These activities in the past have led to flooding of salt mine. We can anticipate that you'll have flooding of salt mines in the future.

ANTI WIPP

Pregnant woman 203 time:

We New Mexicans who voice our opposition to the outrage the DOE called the Waste Isolation Pilot (?) Plant will not be deterred, will not tire, will not give up until the DOE realize that we are speaking for the majority of New Mexicans. 15  
The DOE (spplause) The DOE shall be convinced to leave New Mexico...dragging their deadly radioactive wastes with them. (applause) 30

What do I think is the best alternative?..As I stated in my testimony...I believe it should be left where it is, where it can be monitored until you have a safe sane and scientifically defensible solution to the problem. 13

ANTI WIPP

Krachener (Hannan) 172 time:15

I'm not a nuclear physicist...and I have to count on these people and trust what they're saying. ..I don't do that now., But I do know that they're hauling in dangerous material and..and I think there could be ill effect to this town and community.



ANTI WIPP

Carlsbad L#3

Girl 89 time: 1:07

Come across as saying this deadly radioactive waste can be retrieved. but you you have never tried to retrieve hot radioactive waste from  $\frac{1}{2}$  mile below the earth's surface. before. 13  
You downplay the dangerous properties of radioactive waste you deliberately have covered up reports which reveal high cancer rates at nuclear facilities and people exposed through other government projects. 2. You say out of one side of your mouth that we the people in New Mexico will have a veto power and out of the other side of your mouth..to the nuclear industry you will have the waste in the ground by 1985 or 86 and you've gotten your way with the New Mexico state legislature which

ANTI WIPP

Carlsbad 4 240 time:

The people in this state have a moral responsibility to their children and their grandparents who have worked, sweated and bled toiled for the betterment of your children. If there's an accident there has to be a reason why no other state in this country and why foreign governments will not take nuclear waste. (:23)

(wild eyed type) ↗

270 time: 10

Now on long term effects...most people think we don't need to worry about 100-thousand years from now.. or 50-thousand years or a hundred years because we won't be here then (grand mother type)

in my opinion is not representative of ...  
the people's opinion in this state. 50 They have set up this concurrence and consultation committee which ...the chairman and the vice chairman are from Carlsbad and very much in favor of the WIPP project of the other 6 men on the committee, there's only one person who has taken a firm anti-WIPP stand. 1:07

ANTI WIPP

303

Time: 04

We may be planting a time bomb in Carlsbad.  
(grand mother)