



15 September 1975

Dr. S. P. Vinograd  
Director, Biomedical Research  
NASA Office of Life Sciences, Code MM  
600 Independence Ave. S.W.  
Washington, D. C. 20054

Dear Sherm,

Sorry that I missed you the other day but I did enjoy talking with you on the phone. Please look over the accompanying list of working groups and pick one that you would like to meet with, for lunch at least. We have a sandwich lunch with the group and I think you would enjoy seeing what is going on in the "National Plan".

Looking forward to seeing you.

Kindest personal regards  
Most sincerely,

*Chuck*

C. W. Shilling, M. D.  
Executive Secretary  
UNDERSEA MEDICAL SOCIETY, INC.

CWS/yd  
enclosure





September 8, 1975

SCHEDULE OF WORKING GROUPS

# 12	HIGH PRESSURE NERVOUS SYNDROME Members were: Dr. Peter Bennett	(COMPLETED)	August 4-8 Chairman
	Dr. Arthur Bachrach Dr. Ralph Brauer Dr. Jean Claude Rostain Dr. Lawrence Raymond (advisor)		
# 5	PSYCHOLOGICAL FACTORS INVOLVED IN UNDERSEA HYPERBARIC EXPOSURES Members were: Dr. Arthur Bachrach & Dr. James Miller Mr. James T. Joiner Mr. Ramsey Parks Mr. James Stewart Dr. Harold Ginzburg (advisor)	(COMPLETED)	August 11-15 Chairmen
# 5T	MEDICAL AND PARAMEDICAL Members were: Dr. Eric Kindwall  Dr. Harold Ginzburg Mr. Chester A. Langworthy Mr. Joseph Rood, Jr. Dr. David Youngblood	(COMPLETED)	August 25-29 Chairman
# 2T	COMPRESSION AND DECOMPRESSION PROTOCOLS Members were: Dr. Robert Hamilton  Dr. E. P. Barnard, Surg., CDR, MCRN Dr. Peter Bennett Dr. Brian Hills Dr. Russell Peterson Dr. Kent Smith Mr. C. H. Hedgepeth (advisor)	(COMPLETED)	September 3-7 Chairman
# 11	USE OF DRUGS AND OTHER MEDICAL TREATMENT UNDER HYPERBARIC CONDITIONS Dr. Tor Richter  Dr. Colin Jones Dr. Tor Nome Dr. David Youngblood		September 7-11 Chairman  Accepted Accepted Accepted



## SCHEDULE OF WORKING GROUPS

Cont.

- # 9      PHYSIOLOGICAL AND TOXIC EFFECTS OF RESPIRATORY AND CONTAMINANT GASES  
          (ACUTE AND CHRONIC)      September 12-15
- Dr. Karl Schaefer      Chairman
- Dr. Robert Hamilton      Accepted  
Mr. David Watts      Tentative  
Mr. Lewis Jenkins      Accepted  
Lt. Melvin Anderson      Tentative  
Dr. Peter Bennett (advisor)      Accepted
- # 1      AUDIO VESTIBULAR DERANGEMENTS      September 16-19
- Dr. Joseph Farmer      Chairman
- LCDR Robert S. Kennedy, MCS, USN      Accepted  
Dr. Kenneth Money      Accepted  
Dr. James G. McCormick      Accepted
- ✓ # 4T      MONITORING TECHNIQUES      September 22-24
- Mr. Andre Galerne      Chairman
- Dr. Kenneth Ackles  
Mr. Charles Duff      (To be held in  
Dr. Linderoth      New York City)  
Dr. M. Spencer  
LCDR David Hall
- # 3      SUBTLE PHYSIOLOGICAL CHANGES      September 22-26
- Dr. Lutz A. Kiesow      Chairman
- Dr. Richard B. Philp      Accepted  
Dr. Ralph Brauer      Accepted  
Dr. Lawrence Raymond      Accepted
- # 8      USE OF GASES OTHER THAN NITROGEN AND HELIUM      October 2-5
- Dr. Robert Hamilton      Chairman
- Mr. Robert Gilardi      Accepted  
Mr. Peter Edel      Accepted  
Dr. R. Brauer      Accepted
- # 13      MICROBIOLOGICAL ASPECTS      October 7-10
- Dr. Cobet      Chairman
- Dr. Bert Schlamn      Accepted  
Dr. E. V. Orsi      Accepted  
Dr. Mozzarella      Tentative
- # 4      RESPIRATORY/PULMONARY FUNCTION IN HYPERBARIC EXPOSURES      October 13-17
- Dr. Herbert Saltzman      Chairman
- Dr. Leon D. Farhi      Accepted  
CDR. W. H. Spaur, MC, USN, EDU      Accepted  
Dr. Mark Bradley      Tentative  
Dr. Lawrence Wood      Accepted



## SCHEDULE OF WORKING GROUPS

Cont.

# 3T	SYSTEMS DESIGN CRITERIA Mr. Bruce Gilman	October 20-24 Chairman
	Mr. W. M. Gianotti	Accepted
	Mr. Max Reiher	Accepted
	Mr. Gene Smith	Accepted
	Mr. Michael Hughes	Tentative
# 7	EXCHANGE OF INERT GASES, OXYGEN, AND CARBON DIOXIDE Dr. Brian Hills	October 20-24 Chairman
	Mr. Alan Krasberg	Accepted
	Dr. H. V. Hempleman	Accepted
	Dr. Kenneth Ackles	Accepted
	Dr. B. D'Aoust	Backup
# 6	COGNITIVE AND PSYCHO MOTOR PERFORMANCE Dr. Glen Egstrom	October 27-31 Chairman
	Dr. Arthur Bachrach	Accepted
	Dr. W. S. Vaughan	Accepted
	Dr. Dorothy Fletcher	Tentative
# 14	THERMAL PROBLEMS Dr. Paul Webb	November 3-7 Chairman
	Dr. Albert B. Craig, Jr.	Accepted
	Mr. Wally Jenkins	Accepted
	Dr. Lawrence Raymond	Accepted
	Dr. Gene Smith	Accepted
	Dr. Charles Johnson	Accepted
# 1T	OPERATING STANDARDS Mr. Michael Hughes	November 3-7 Chairman
	Mr. Thomas Angel	(To be held
	Mr. Andre Galerne	in Houston,
	Mr. John Goletti	Texas )
# 2	OSTEONECROSIS Dr. Kent Smith	November 10-14 Chairman
	Dr. Dennis N. Walder	Accepted
	Dr. Lent Johnson	Tentative
	Dr. J. Leon Sealey	Accepted
	Dr. John Heard	Accepted
	Dr. John Paul Jones	Accepted
# 6T	LEGAL AND COMPENSATORY ASPECTS Dr. Peter Bennett	November 17-21 Chairman
# 10	OXYGEN Dr. James Clark	November 22-26 Chairman
	Dr. Morris D. Faiman	Accepted
	Dr. Aaron P. Sanders	Accepted
	Dr. Aaron Fisher	Accepted



## UNDERSEA MEDICAL SOCIETY EFFORT

The Undersea Medical Society, Inc. (UMS), together with the Marine Technology Society (MTS), as a subcontractor, is setting in motion an organization that, within a period of six months, will prepare and deliver to the contracting agency (NIOSH) a NATIONAL PLAN FOR THE SAFETY AND HEALTH OF DIVERS IN THEIR QUEST FOR SUBSEA ENERGY.

In spite of all of the past research and experience there are many problems arising for which answers do not appear to be available.

What is required is a well organized attack to codify the available knowledge in such a way as to be useful to the diving industry and to the Federal Agencies planning research, training and support programs.

In the process of collecting and analyzing what has been reported and what is known by the experts some answers to present problems may be found, and certainly it will be possible to identify gaps in our knowledge and to suggest areas requiring research and development.

The UMS, with assistance from MTS, proposes to accomplish this study and document

WHAT is being done  
WHO is doing the work  
WHERE the work is being done  
WORK that ought to be done  
ORGANIZATIONS or LABORATORIES capable of doing it and  
ORDER OF PRIORITIES

The PLAN OF OPERATION is as follows:

### A. Staff Preparation

Search the UMS library file for all material relevant to the problem area, using the Termatrix system.



Read all abstracts for relevance.

Pull or obtain hard copy.

Analyse all of the background material and arrange in order according to the important subject areas. For example: for Osteonecrosis, the reference material in the form of informative abstracts would be grouped under the following headings:

Pathogenesis  
Epidemiology  
Early diagnostic techniques  
Therapy  
Problems dealing with workers compensation  
and legislation, i.e., medical-legal  
problems.

This analyzed material will be prepared for use by the special working group "Expert-Authors".

B. Expert-Authors

The Expert-Authors (see section D. on "Special Working Groups") will assemble for a five day working period and come up with a series of pertinent recommendations to be added to the bibliographic review. Their recommendations must include the WHAT, WHO, WHERE, WORK, ORGANIZATIONS or LABORATORIES, and ORDER OF PRIORITIES as mentioned above.

The experts will be recognized "authors" of each Special Report. The UMS Special Planning Committee has prepared a list of Expert-Authors from whom selection will be made for each special subject area.

C. Manager-Editor will:

Work with the "expert-authors" for the five day period, making sure that they cover all of the necessary points.

Prepare the final report on their assigned problem area.



Be responsible for each special report being printed ready for distribution.

D. Special working groups

A special working group called the "Expert-Authors" will be formed for each of the problem areas outlined in the proposal. Thus, there will be 18 special working groups.

The average size of the working group will be 3 1/2 individuals (fiscal accounting, i.e., 2, 3 or 4 depending upon the subject area) chosen because of their knowledge and competence in the special problem area. Additional consultants may be called, if needed.

The composition of each working group will depend upon the subject area; e.g., for bone necrosis, at least two individuals would be biomedically oriented; for testing and certification of equipment, two of the three (or four) would be engineering types; for performance and psychological changes, two would be psychologists expert in hyperbaric activity; etc.

Where appropriate, working groups will have at least one operational person representing field activity.

Selections will be made by UMS and our subcontractor MTS with approval in each instance of the NIOSH contract monitor.

The operation of the working groups will be as follows:

- Not more than five consecutive days of the two to four individuals, during which time the prepared literature review and analysis will be critiqued, organized and a determination made as to the areas of research being currently investigated and where it is being done. Recommendations will be made as to what work needs to be done, and all work within a given problem area



will be rank ordered as to priority for active support. The work must be completed by the end of the 5th day: NO ONE will be allowed to take work with them to be completed later. For this effort to succeed, a monograph must be put out on the average of one every ten days; thus, each working group must complete its problem area before they leave.

- To assist in this, a managing-editor will be assigned for the five days to each of the working groups. This person will be responsible for making certain that all of the needed information is obtained and that the report is written up ready for printing.

- Secretarial assistance will be assigned to each working group for typing up their material as they go along and for the final report in camera ready copy.

- Mrs. Margaret Werts, UMS bibliographer, will be responsible for furnishing to each working group a package of abstracts and/or hard copy, as desired, of the total literature in the field. Anything not already available will be obtained at once.

#### Monograph for each special area

A monograph will be prepared for each area studied. The monograph will include an identification of the problem, data considered, list of priorities in each area, research needs and outlines of needed work, and recommendation for accomplishment. The monographs shall be capable of "standing alone" and be supplied for approval and use whenever during the contract the study of a given subject area is completed.

#### DESCRIPTION OF WORK

The following is a description of categories that will be



researched in the development of the NATIONAL PLAN FOR THE SAFETY AND HEALTH OF DIVERS IN THEIR QUEST FOR SUBSEA ENERGY.

It must be remembered that in every instance there will be a previous review of the existing literature dealing with each subject area that will be provided to the Working Group and on which, together with their own personal knowledge, they will base their consideration of the subject area.

The following are the proposed working areas:

1. Audio Vestibular Derangements

In considering audio vestibular derangements, the following areas will be investigated:

- Etiology
- Diagnosis
- Mechanisms involved
- Relationships to hearing loss
- Sequelae
- Treatment

2. Osteonecrosis

The following areas will be considered in developing this important subject:

- Epidemiology (incidence)
- Early Diagnostic Techniques (to include standardization of x-ray interpretation)
- Pathogenesis
- Sequelae
- Treatment

3. Subtle Physiological Changes

The following physiological changes are considered as they are associated with hyperbaric activity:

- Cardiovascular changes
- Hematological Changes (platelets, etc.)
- Serum Enzymes
- Endocrine Changes
- Hydrostatic Pressure, (subtle effects of)
- Nutrition



4. Respiratory/Pulmonary Function in Hyperbaric Exposures

Because of its crucial importance, this subject will be considered separately.

5. Psychological Factors Involved in Undersea-Hyperbaric Exposures

The following area will be considered:

- Selection
- Training
- Personality Changes
- Small Group Interaction
- Stress

6. Cognitive and Psycho Motor/Performance

Performance is the ultimate goal for all underwater work.

The following areas will be considered as they affect performance:

- Temperature (largely cold)
- Human Engineering (the impact of all types of equipment, either worn or used by the individual)
- Hydrostatic Effects
- Sensory Factors
- High Pressure Nervous Syndrome
- Environmental
- Procedural
- Human
- Equipment

7. Exchange of Inert Gases, Oxygen and Carbon Dioxide

Areas to be considered are:

- Bubble Formation and Resolution
- Cellular and Extracellular Gas Movement
- Counterdiffusion Phenomena

8. Use of Gases Other than Nitrogen and Helium

The factors to be considered are:

- Safety
- Thermal Conductivity
- Diffusion Characteristics
- Density
- Availability and costs
- Toxicity



9. Physiological and Toxic Effects of Respiratory and  
Contaminant Gases (Acute and Chronic)

The special topics to be considered, here, are:

Inert Gas Narcosis  
Effects of Increased Carbon Dioxide  
Effects of Carbon Monoxide  
Trace Contaminants

10. Oxygen

Factors to be considered are:

Physiological Effects  
Toxic Effects

11. Use of Drugs and other Medical Treatment under  
Hyperbaric Conditions

This is a particularly important area about which very  
little is known. The following areas are to be considered:

Injuries Occurring Under Pressure  
Use of Anesthetics While Under Pressure  
Therapeutic Use of Antibiotics, Antihistamines, etc.  
The Sequelae of Normal Illnesses  
Surgical Procedures

12. High Pressure Nervous Syndrome

The areas to be considered are:

Etiology  
Symptomatology (including measurement techniques)  
Prevention  
Selection  
Treatment  
Sequelae

13. Microbiological Aspects

Following are the areas to be considered:

The effect of the Hyperbaric Environment on the  
common organisms in their transmission to members  
of a group in a diving space.



The introduction of Marine Organisms from the  
water environment into a habitat or bell.  
The effect of hyperbaria on host-parasite relationship.  
The effect of hydrostatic pressure on micro-organisms.

14. Thermal Problems

Areas to be considered:

Physiological Effects  
Evaluation of Protective Equipment  
Treatment and re-Warming  
Respiratory  
Prevention  
Metabolic Effect

Diving Technology and Resources

1. OPERATING STANDARDS

Areas to be considered:

Selection of Diving Personnel  
Operating Techniques  
Selection and Training  
Personnel Qualifications  
Procedures  
Equipment

2. COMPRESSION AND DECOMPRESSION PROTOCOLS

Areas to be discussed:

Dive requirements, such as short duration,  
saturation, excursion, etc.  
Treatment

3. SYSTEMS DESIGN CRITERIA

To: Research Existing Standards, Diving Equipment, Tools

such as:

Diving and Support Equipment  
Shallow Surface  
Deep Surface  
Short Duration Bell System  
Saturation Bell System  
Submersibles



Habitats  
Tools  
Research Facilities

4. MONITORING TECHNIQUES

This is to include all types of physiological monitoring on line, (real time) insitu, in all diving system.

5. MEDICAL AND PARA-MEDICAL

Areas to be covered:

Selection and Training  
Medical Coverage  
Medical Requirements

6. LEGAL AND COMPENSATORY ASPECTS

Panel should include representatives from:

Federal Government Court of Claims  
(1) Representative from A.D.C.  
(1) Union Representative  
Legal Profession  
Contractor  
Labor Department Attorney  
Insurance Representative from Major Workmen's  
Comp. Carrier.

®



UNDERSEA MEDICAL SOCIETY • INC.  
9650 ROCKVILLE PIKE  
BETHESDA, MARYLAND 20014

NONPROFIT ORG



Dr. S. P. Vinograd  
Director, Biomedical Research  
NASA Office of Life Sciences, Code MM  
600 Independence Ave. S.W.  
Washington, D. C. 20054