SE-SMD-III-081
JSC-13076

LIFE SCIENCES SPACELAB MISSION DEVELOPMENT TEST III

SMD-III POST TEST MEDICAL REPORT

National Aeronautics and Space Administration

LYNDON B. JOHNSON SPACE CENTER

Houston, Texas

May 24, 1977

SMD III POST TEST MEDICAL REPORT

Prepared by _____

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Approved by _____

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_____

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FOREWORD

This report is one of several that have been prepared to document the results of the Spacelab Mission Development Test III. This simulation was conducted in the Johnson Space Center Life Sciences Payload Development Facility from May 17 to 23, 1977.

This report covers direct clinical support to the crew as well as assistance and counsel to others in crew selection, health stabilization of the crew and the laboratory animals, and habitability and duty schedules.

TABLE OF CONTENTS

Problem or Objective	Observations During SMD-III	Recommendations for the Future
Flight crew and animal health stabilization.	The attempt at having short, e.g. 1-week, stabilization programs was dismissed early in SMD-III discussions. Subsequent to that, there was almost no action for at least 6 months, then much attention to exams for animal handlers (including crew), exams for animals, and control of contacts with animals, particularly animals in the mockup and animal holding facilities.	Earlier formalization of required health screening examinations for animals: earlier identification of examinations for humans; earlier identification of tracking and monitoring schemes for health data being generated in real time up to the time of test initiation; greater coordination of exam protocol between Ames and JSC with timely completion of exams at both sites and centralization of the data at all prime worksites. (This would have meant timely receipt of the Ames physicals at the JSC Occupational/Flight Medicine facility.); assess impact of actual FCHS*.
Medical Support Plan and Medical Operations Team.	The functions and duties of the Medical Operations Team were defined in the Medical Support Plan within the context of medical OTR's (Operational Test Requirements) that did get surfaced relatively early in the pretest period. However, adequate attention was paid only to the medical kit and illness simulation preparations. There was faulty development in the pretest medical checks in that a very bare minimum of examinations was set up for the crew. The prime exception, but a very proper one, was the opportunity to do an extensive, full-week examination on the payload specialists, reflecting	As mentioned, the medical kit development proceeded quite well, perhaps lacking mostly in adequate actual rehearsal or utilization of that kit in specifically designated clinical situations. As far as the question of pretest medical checks, it should be asserted that these were relatively adequate but should have been reinforced with at least one major general physical examination in the time frame of F-3 months to F-1 month. Finally, in regard to the medical monitoring and specifically addressing the experimental clinical interface, that correction is referenced in the attached memo 1 which proposes a means for developing such an interface.

*FCHS - Flight Crew Health Stabilization

Problem or Objective	Observations During SMU-III	Recommendations for the Future
	the projected phase I/phase II examinations actually planned for true payload specialists in the future. However, in the case of the mission specialist, only brief examinations were left on the schedule and the earlier projected F-3 month and F-1 month exams, which were more extensive, were never performed. As far as the Medical Operations Team and the medical monitoring, these suffer from the fact that inadequate interface was developed with the experimenters in the entire process ranging from selection to the actual monitoring of the experiments in the pretest and intest periods (for the select purpose of utilizing such data in assisting in the clinical evaluation of the crews). Additionally, although a major step was made in locating a monitoring console with single-channel video and single-channel audio in the Clinic, this step was not expanded to include 2-way voice and full communications circuit capability nor a full (at least daytime) medical team to monitor the test console or to participate in some of the requisite tracking work in assembling crew-related and animal-related data in the pretest and intest periods. A system of coordinating the on-call support of the Mission Surgeon was established with several physicians	And finally, it probably would be advantageous if the Medical Operations Team, although maintaining its physicians on an on-call schedule rather than a fixed console position, at least maintained semipermanent to permanent staffing of a secondary support team which can interface with the other components of tests or flights.

Problem or Objective	Observations During SMD-III	Recommendations for the Future
	participating in this support. However, they would have been further aided by having a secondary support team available to them to interface between themselves and the flight operations and science-supporting sections of SMD-III.	
Specific animal considerations:		
a. General animal health stabilization	Admittedly the plan for SMD-III was formulated rather late. The committee designated to address animal health did deliberate many hours during a rather brief period in which the basic document was generated and such major concerns as herpes B were resolved. But, subsequent to that, formalized tracking by this committee again returned to a less efficient state. Specifically referenced by that comment are the breakdown in the flow of microbial reports through the committee to the clinical side of the Medical Operations Team. And, although the detection of the Strongyloides was instrumental in the early and efficient flurry of activity, no subsequent findings again arose to jar the committee to the same pitch and fervor that initially were associated with its birth. Another observation is that a microbial contamination control plan became somewhat muddled in its execution as that plan came under the control and direction of the more general animal health stabilization program.	The obvious recommendation is for a more timely definition of an animal health stabilization plan, earlier selection of a monitoring committee, and a more timely designation of consultants to that committee. Also, in the same context that a staff was recommended for the overall Medical Operations Team, it is felt that enough work exists within the area of animal health that a staff should be available to support the minutiae that must of necessity be tracked in any program such as animal health stabilization. The same staff could be utilized to support animal health and the more general Medical Operations Team requirements.

Problem or Objective	Observations During SMD-III	Recommendations for the Future
b. Occupational Health Clinic interface.	The Occupational Health Clinic at JSC, after being apprised of the nature of the SMD-III test, quite rapidly assimilated the new protocols for both the initial examinations as well as follow-up examinations for animal handlers and the more general community of personnel supporting SMD-III. Some difficulty in identifying all the personnel supporting SMD-III existed. As previously mentioned, Ames, which has been doing a form of animal handlers exam for some time, did an exam which was not entirely concordant with the one at JSC and additionally there was only about a 75% delivery of the basic health data (of those people designated as animal handlers) from Ames to the JSC Clinic; this data of course was for background (Ames personnel) to the JSC Clinic.	The obvious recommendation here is to apprise all participating occupational health facilities of the purpose of the test and the exact nature of the examinations required, both initial and followup.
Flight Operations interface with the Medical Operations Team.	There was a continuing and fairly efficient interface between the representatives of the Flight Ops Team and the Medical Ops Team. Initial test conditions and guidelines fomulated by FOD closely paralleled the recommendations and suggestions of the Medical Support Plan. The prime difficulty came up in the context of just what the private medical conference was to mean in the context of both SMD-III and future Shuttle flights. Members of the Medical Operations Team worked closely with the Flight Ops Team in the formulation of the medical and general animal flight rules. Additionally,	For the Future, the close relationship between Flight Ops and the Medical Ops personnel should be continued. There probably is no magic solution to direct conflicts between the Medical Ops Team and the Flight Ops Team when there are Astronaut Office Participants, who are also physicians, taking stands which may be opposite to those of the physicians in the Space/Clinical Medicine Branch. When such conditions arise, if not resolved at the local level, they will tend to be referred to higher level arbitration and may be modified by decisions not of

Problem or Objective	Observations During SMD-III	Recommendations for the Future
	a supplemental session was held to more specifically clarify the radiation restraints on this particular mission. The console procedures were formulated; these were relatively limited because there was no fixed medical console. That, in itself, is not meant to imply a problem. The problems that did exist revolved around what would be the nature of the private conversations between the medical representative onboard and a designated representative on the ground.	benefit to either of the original disputing parties. The recommendation then is that interphysician working groups be increased to minimize the number of situations which require higher-level decision making within the directorates. Specifically, in regard to the question of the private medical conference and whether it should be daily and scheduled or the opposite of this condition, a compromise proposal was brought into the picture, but at that point outside arbitration had already determined that the private medical conference would be only as required (on an as-requested basis by either the onboard medical representative or the ground medical team member). See the attached memo 2 for the proposed schedule of private medical conferences applicable to real Shuttle flights projected for the future. Another area that could stand some beefing up would be closer interface between the clinicians and our own internal radiation group in the earlier mutual awareness of the range of radioactive hazards, the potential for exposure as well as monitoring and requisite cleanup.

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Habitability maintenance.	Habitability maintenance in SMD-III seemed to have the problem of being scattered across OTR's and disciplines. Not that it seemed that too little attention was paid, but a tighter fusion of those people concerned with microbiology should be effected with those who are actually deciding just what wipes or manner of clean up should be used. The crew probably interjected many of its own preferences or best guesses, but an area as important as this in terms of preventive medicine deserves a more coordinated effort.	Any test or flight of this nature should have a single person designated as a Habitability Maintenance Officer who could tie these loose ends together and at the same time probably make a better assessment after the test or flight just how efficient the various attempts were.
Food status.	There were recurrent complaints about the quality of the food, but more emphatically about the alleged gastrointestinal upset induced by it. The fact remains that the food people have always instituted organoleptic, hedonistic panels to check out the suitability of the food; and the microbiology data, which was also reviewed, was consistent with the picture of safe food. There were allegations of some unsanitary conditions in the food preparation area which would merit investigation if true.	Perhaps the problem is that with any new set of foods, irrespective of its bacterial quality, the introduction of new chemical mixtures, new preparations, and new spicing patterns can lead to differences in the total gastrointestinal response to the food - something that perhaps is not adequately researched or tested on the crews given the brief food exposure periods in the pretest period. A more simplified diet that utilizes less of the multi-ingredient foods such as sausage, beef hash, and the like, is suggested.

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Waste system operation.	This is another important area in which only the crew's observations can be introduced, as there was no real personal exposure to the equipment by members of the Medical Operations Team. Comments ranged from the time consuming to the illsized nature of the waste collection system.	It would be helpful if all members of the Medical Operations Team and perhaps selected members of the Flight Operations Team actually utilized the waste management system. For the Medical Operations Team this is especially important if symptoms as diarrhea occur, also because the members of the Medical Operations Team should understand the technical complexity of the WCS.
Noise considerations.	Certain high noise levels were emphasized by the mission specialist and these researched with adequate thoroughness by appropriate members of the Life Sciences Team. Levels were not overtly harmful to health but did exceed the projected Shuttle upper limit levels, which also emphasize maintenance of efficiency and comfort (see memo 3).	Early identification of all noise sources should be continued and acoustic treatment accomplished on those judged to be annoying or hazardous.
Crew training and crew time scheduling	Several times in the pretest period the crew expressed significant concern about overscheduling into the evening and weekend hours. Guidelines were proposed in the pretest period (see memo 4). The general recommendations that were made suffice as a starter, but the more refined ones can follow only if one has more intimate awareness of the exact training that is involved.	The Medical Operations Team, using additional support members, should be more in daily touch with the actual training of the crewmembers to permit a more refined estimate of excessive crew time commitment to training. As a general rule, however, attention must be given to the point that, besides the overtly scheduled training time, the crew does need a certain amount of time which remains unscheduled but which is used for reading, thinking, and perhaps even performing some of the experiments on their own.

Problem or Objective	Observations During SMD-III	Recommendations for the Future
Medical training.	For this test, detailed medical training for the onboard physician and the designated alternate medical support member (Carter Alexander) was minimized, with flight independent training essentially being waived based on the general medical experience of these two crewmembers. In the general flight situation, Spacelab attached crewmembers would undergo an extensive training program which would include flight medical training.	The Shuttle Crew Medical Training Plan now in near final review cycle should be invoked.
Illumination/temperature/ humidity/ventilation	These are items contributing to habitability that were not specifically reviewed by the Medical Operations Team personnel. However, crew comments in this area were generally favorable to positive. Additionally, many of the SMD-III constraints had very little relevance to the eventual Shuttle flights.	These entities comprise an essential part of habitability and should either be integrated within the Habitability Maintenance Officer's realm and, if not, should be singled out for medical review with those engineers specifically designated in charge of these areas.
Toxicology.	No overt problems were identified in relation to SMD-III in this area and it did not receive emphasis.	Toxicological concern should be one of the components blended in with habitability and it should merit clinical review.

Problem or Objective	Observations During SMD-III	Recommendations for the Future
Medical monitoring (crew medical checklists)	A daily medical checklist and log for the crew was initially proposed as mandatory but in the discussions between the medical crewmember and the ground medical team the final decision was to leave these voluntary. No experimenters considered the detailed physiological data on the crew relevant to their experiments.	In the future the basic physiological parameters in the daily checklist log (see copy in the Medical Support Plan) should be entered on a daily basis by each onboard crewman and, if at all possible, should be voiced to the ground team in order to permit them to most efficiently analyze their experiments and for the clinician to assure that the various facets of preventive care are indeed being addressed.
Medical monitoring (crew health data)	Pretest health data available to the onboard physician was available only in a couple of summarized hard paper sheets.	Health data could be provided in summary format on small cards or, more optimally, could be provided through a computer system which would not only have the pretest data but would be updated with any intest developing medical events. This same system should be available to to the ground physicians. (This system was not available to the ground physicians in this test.) This function would require appropriate staff on the Medical Operations Team.
Medical monitoring (consultant services)	Outside consultants in internal medicine and surgery were defined and were integrated in the Medical Operations Team's support. An infectious disease consultant was available through other procurement.	The system of outside consultants in key specialist areas should be continued and further attempts should be made to expose these outside consultants, in the pretest period to the crews and the specific problems associated with the given test and/or flights. These consultants should be provided (and they were provided in

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		SMD-III) minimal stipends, with specific additional payment then coming as their time was utilized for the support of the test and/or flight.
Medical monitoring (paging)	The paging method for reaching physicians on call was severely taxed in this SIM in that it demonstrated that the current system (utilizing the base dispatch officer) puts a step in the process that is not fully efficient. The dispatch officer apparently did not realize that his primary job was to document the message and the source and beyond that merely to notify the hospital to execute the calling of the MOD** with either a specific number for the physician to call in that message or (in its most simple form) to have the physician return the call to the base dispatch officer for further clarification of the message. At any rate the base dispatch officer essentially functions as a member of a secondary tier in the medical support team would function, namely as a coordinating point for receipt of messages requesting the MD, as from the TD; the job is to reach the physician. The problem with the base dispatch officer is that he is normally concerned with a wide spectrum of potential sources that might need the MD; the base dispatch officer may not understand the background of the test and may very	It would be more advantageous if a system of paging could be established at which there was at most one intermediate person between the requester and the requested MD. That person should be a member of the Medical Operations Team. Personnel in the system should be knowledgeable of the potential situations that may arise, and a system which operates as described under observations should be implemented. This or another paging system for the Medical Operations Team must be established.

**MOD - Medical Officer of the Day

Problem or Objective	Observations During SMD-III	Recommendations for the Future
	easily transmit a faulty or incomplete message. He is the first person in the chain of communications; and then of course, there is the second element (the person that actually transmits the message from the hospital-located transmitter). So we had in the loop for obtaining the MD two people who had no direct knowledge of the problem that may have generated the call for the MD in SMD-III. In all simulated events, it was clearly demonstrated that the NASA-based paging system has deficiencies at the dispatcher level and non-guaranteeable functioning of the remote site equipment (namely the pagers and radio-telephone). Additionally, the radio-telephone which was utilized in a couple of the situations in SMD-III clearly points out the superiority of having the oncall MD have the capability to make a direct call to the requester as soon as he has received the page. Again, the radio-telephone as currently configured requires going through the base dispatch officer, at least for the initial tagup, and then patching in to the phone that the physician may be calling. The state of the art is such that one can establish a system in which these human elements can be reduced in number.	

Problem or Objective	Observations During SMD-III	Recommendations for the Future
Medical simulations/real clinical events.	Several medical simulations were introduced in SMD-III; there was a minimal-impact evolution of an allergic type history in PS-1 which, when the recommendation came that perhaps he should not work with the animals, was turned down in order to not impact simulated experiment scheduling. Additionally, the MS simulated dental pain which was low and variable for some time until it became severe, and the increase in pain resulted in an actual passing in of supplemental pain medication; eventually, the threat of calling the dentist to provide direct aid at the mockup caused this event to be declared a simulation. Finally, on the last day, PS-2 simulated a monkey bite and this was correctly responded to medically. Also miscellaneous references were made to cuts, scratches, tinea pedis, odor, and difficulty in hygiene; no great medical problems were built out of these although these were true complaints.	The medical kit needs further exposure in real clinical situations; items were generally adequate but procedures were not taxed in SMD-III.

MEMORANDUM

Lyndon B Johnson Space Center NASA

REPLY TO: SD52/M96-77	DATE	INITIATOR SD52 JRHordinsky:jbrw:5-1-77:4021	SYM

TO: SD6/Chief, Experiments Working Group

cc: SD/W. H. Shumate
SE5 W. H. Bush
CB W. E. Thornton

FROM: SD5/Chief, Space/Clinical Medicine Branch

SIGNATURE: Sam L. Pool, M.D.

SUBJ: Clinical Experimental Data Review for SMD-III (and Beyond)

This is a direct reply to memorandum No. SD6-90-77.

We should be (and should have been) discussing the relative merits of the request for parameters of clinical interest in SMD-III.

This should have been pursued in the following series of steps (and because it was not routine policy, we probably will not have an effective utilization of the experimental data for clinical purposes in SMD-III):

a. A statement of the clinical value of the proposed experiments should be made at the time of the selection of the experiments for given test flights. The clinical value should have been one of the criteria for or against selection of specific experiments.

b. Members of the Clinical or Medical Operations Team should work with the relevant experimental team members to become familiar with the specific experimental protocols. If a crewmember is designated as part of the Medical Operations Team, then he could provide this initial survey for the Clinical Team.

c. A judgment on the real-time clinical value of specific parameters, experiment by experiment, would then be made, particularly enlisting the aid of physicians associated with the experiment as P.I.'s or as participants.

d. Definitions of the methodology for procurement of these designated clinical parameters during the pretest, in-test, and post-test phases would be established well in advance of any onset of collection of such data.

e. This methodology would involve a team relationship between the experimenter, the crewmember participant, the Clinical Team member, as well as the key representative member from the data handling world.

This was the intent of the original SMD-III OTR's (especially number 3) and the relevant sections of the SMD-III Medical Support Plan.

In regard to the question of how outside investigators should view this process of experimental data being used for clinical evaluation, this should not prove to be a problem if certain key steps are observed.

One prerequisite is that the incoming P.I.'s be apprised of their responsibility to participate in this system of developing any possible real-time clinical application of their test or flight experiments.

Additionally, as far as outside investigators being concerned that a process of experimental data being used for clinical utilization may result in premature release of experimental data, this should not be viewed with alarm if the following guidelines are practiced. And, I would urge these to so be practiced.

a. The clinical health status of the crew is a prime priority and responsibility of the S&LSD.

b. The clinician must have the maximum data available to judge the health state. If there is an onboard medical provider, he could serve in watching for many of the clinically relevant signs. But this onboard medical provider would need to be provided with and be desirous of utilizing the time to watch for the clues from the relevant experiments. Depending on the amount of interest and time for the onboard medical representative, this would decrease the amount of the actual data that would need to go directly to the ground medical representative in real time.

However, the part that would be synonymous between flights or tests that have a clinician onboard and those that do not have a team member serving as such is that agreed upon parameters and situations would be clinically checked off during the execution of the experiment. In one case, the end-point of that check would be the onboard crewmember; and in the other case, actual transfer of such data to the ground medical team in real time or near real time format would be required.

c. Enhanced awareness by the nonphysician experimenters in the clinical process is essential. As a baseline example, the evaluation of the LBNP as an experiment (with its multitude of carefully monitored parameters) contrasts with those extractions of the LBNP data that have clinical usefulness as premonitors of degenerating health status (as examples, are emphasis on the ECG and emphasis on the maximum and minimum heart rates and blood pressure at maximum stress). There is a great value for the clinician in obtaining such extracts of experimental data as premonitoring signs. Yet at the same time, it is acknowledged that many of the experiments will still be in evolution and far from completion as far as "pure experiments" are concerned.

d. Only selected sampling of the experimental data would be used by the clinicians (as determined in the review process outlined in the first section).

e. Any data released (whether to the general public or specific outside interests) of a clinical nature and related to crew health is already greatly circumscribed because of the requirements of the Privacy Act (and before that, good professional courtesy to the "patient"). Additionally, this outside reporting would (and when properly executed was so done in the past) reference experiments

only as they reinforced the statement of the clinical health status; and there would be no reason or need to reveal "complete trends" of the data, a perogative of the NASA (and the assigned experimenter) per the nominal channels after the eventual analysis of this data. (I would comment, however, that it is my observation that this nominal process of official data release by experimenters does seem to be somewhat dragged out and perpetually stated as "preliminary.")

f. Another safeguard against the incorrect release of experimental data imbeded within the clinical report is the fact that this release has and will continue to come from the official representative, either the Chief or designated Chief of the Medical Operations Team. As such he would have a NASA specific responsibility to stick to his job as a clinical representative and not an experimental representative. It would be inherent within the definition of his (or their) position(s) to limit their communications because of reasons as explained in the prior steps.

This (these) person(s) would only consider slightly expanded release of clinical data to outside consultants (when designated by NASA as part of the Medical Operations Team and faced with a real-time problem), to specific family members (with prior NASA and crew arrangement and knowledge), or to specific outside parties who have administrative control over specific crewmembers (as for instance, foreign crewmembers or crewmembers from specific universities or industries), but again with prior NASA arrangement with that outside administrative unit and the corresponding crewmember. In all the prior cases the transfer of data would still be of a clinical nature and would still be extremely limited (again for the reasons outlined previously).

MEMORANDUM

Lyndon B Johnson Space Center — NASA

REPLY TO:	DATE	INITIATOR	SYM
SD52/M97-77	May 2, 1977	SD52 JRHordinsky:jbrw:5-2-77:4021	1

TO: SD5/Sam L. Pool, M.D.

cc: CB/W. E. Thornton
SD/W. H. Shumate
SE5/W. H. Bush

FROM: SD52/Jerry R. Hordinsky, M.D.

SIGNATURE

SUBJ: Private Medical Conferences in SMD-III

You had asked earlier for a definition of the rationale behind the daily private scheduled medical conference.

I have reviewed the issues and have heard the pro's and con's from various elements within both S&LSD and FOD, and I would be more prone to accepting the compromise proposal attached (as opposed to the all scheduled or all open mode).

Nonetheless, I have provided the reasons for going the route of a daily private scheduled versus the reasons for an as requested type of private medical conference.

I do not personally feel that strongly about a mandatory daily conference. On the other hand I do not agree with some of the FOD arguments that it should be left to total discretion of the onboard or ground medical representative. And, especially I do not feel that the premise for establishing a totally discretionary scheduling system exists because no matter how hard we may try, I feel that it will be very difficult to ever have the onboard medical representative as close a member of the Medical Operations Team as we would like; and the prospect exists that he can be swayed by his commitment to carry out more general crewmember tasks at the expense of some of his medical obligations.

In summary, then, although I have included in the enclosure reasons for both a daily conference and a fully discretionary medical conference, I would urge that more consideration be given to the specific compromise scheduling of medical conferences, which stresses mandatory conferences only at those times that prior spaceflight experience has shown us a specific need. At the same time I am for stressing that we must have full agreement that the onboard medical representative is an integral part of the Medical Operations Team and that this premise must be satisifed before any sort of liberalization or transfer of medical responsibility to the onboard crewmember can effectively happen.

Jerry R. Hordinsky, M.D.
May 4, 1977

RATIONALE FOR THE VARIOUS SCHEDULES OF PRIVATE MEDICAL CONFERENCES IN FUTURE SPACE FLIGHTS

Rationale for Daily Scheduled Private Conference

1. Less focus on private medical conditions to parties such as the news media.
2. Lets the onboard medical provider inquire in an unobtrusive way about medical events.
3. Is based on the premise that the onboard provider is not a fully independent judge of medical events.

Rationale for an As Needed Schedule of Private Medical Conferences

1. Presupposes sufficient onboard medical expertise, including all the appropriate preflight training.
2. Presupposes a daily review and logging of a multitude of daily events of medical relevance.
3. Presupposes a disciplined coordination between the onboard medical provider and the ground medical support team.
4. Is more correspondent to the actual practice of medicine on the ground.

Compromise Proposal for the Scheduled Private Medical Conference

1. Definitely should be scheduled within 1 hour of entry into 0-g and on each of the first three evenings (correspondent to ground time) of the space flight; this is the period when we know between one-third to one-half of crews experience some form of medical problems.
2. Routine scheduling should be every four days minimum; this would provide for routine updating of medical status.
3. Should be routine scheduling the night before return to earth; would allow important pre-entry medical review and clearance.
4. Other scheduling should be subsequent to the specific request of the onboard medical provider or the ground medical support team member.

U.S. Government

MEMORANDUM

Lyndon B. Johnson Space Center

NASA

REPLY TO: SD52/M61-77

INITIATOR: SD52/JRHordinsky:jbrw:3-24-77:4021

TO: SE5/Chairman, SMD-III Mission Management Board

ARC/W.E.Berry, 236-5 SD6/W.E.Feddersen
ARC/P.X.Callahan, 239-5 SD6/J.A.Rummel
CB/W.E.Thornton
SD5/C.P.Bergtholdt
SD5/J.L.Homick

FROM: SD52/SMD-III Chief Test Support Physician

SIGNATURE: Jerry R. Hordinsky, M.D.

SUBJ: Noise Levels in the SMD-III Environment

I have reviewed a preliminary octave band analysis of the 0-g workbench that comprises part of the SMD-III apparatus. Although the levels are below those officially labeled as hazardous to health, the labels noted are above those levels considered comfortable for communication, particularly in view of the fact that the level at 1,000 Hz was 78 db. The attention focused on the SMD-III 0-g workbench probably was more direct because of its unique irritation to the participants. However, it is medically necessary that a general sound level analysis of the SMD-III environment be achieved. The analysis should preferably be scheduled during training that has maximal utilization of noise generating equipment and procedures. The analysis would not necessarily need to directly interfere with the execution of the crew procedures and could be accomplished by Dr. Homick. Additional support could be obtained as required from the Occupational Health Laboratory available on site.

Again the emphasis here is not that overtly harmful environmental parameters have been spotted, but from the point of view of comfort, maintenance of efficiency, and the possible cumulation with other stresses, a systematic noise analysis is in order.

MEMO 3