PAO Good morning. Thank you for joining us. We're here with offgoing Flight Director, Gary Coen, and also the Spacelab mission manager, Joseph Cremin. An announcement before we get started: the TV schedule shows a briefing by mission scientist, George Vichtel at 11:30 this morning. That won't take place. It's gonna be combined with Bill Reeves' change of shift press conference this afternoon at 5:30 p.m. as we announced yesterday just to update you on that. We 'll start with a statement by Gary Coen and then we'll go to Joe and we'll take your questions after that. Gary...

GARY COEN (FLIGHT DIRECTOR) OK. The vehicle and the crew are progressing right along as expected. In fact, Bob called us up this morning and told us that they had been sleeping like logs which tends to say that the folks are all chipper and really going at it. The Orbiter is currently in a 192 x 189 orbit. We're trailing NUSAT now by about 400 miles. We're gradually losing about 10 miles per rev falling behind the NUSAT. The best to say that, I guess, is that the NUSAT is going in front of us. We have tried to take a good long look at the weather, Monday. It's really a little too far ahead to forecast but the crystal ball says that the weather is looking good at all the continental U.S. sites.

We have made some headway on the problem we've been having with the bleedthrough on the communciations inside the lab. The problem was caused by a Y-connector that was put in there to facilitate multiple use. What we're doing now, what the crew is doing now are they're using the hardline and the speaker box for intercom. When they are in a hurry to get intercom with one another they just use air-to-ground because the other fellows can, the other people in the lab can monitor it. Mission duration: we are not currently planning to extend the length of the mission. We are power-limited. We start out with a mission margin over our normal two days extension capability that was about sixteen hours. The numbers came back today, again showing sixteen hours, so we're not gaining or losing against our margins. The recommendation from the flight team is to end the mission on time at this point. GLOMR: GLOMR, we do not attempt, intend, excuse me; to make another deploy attempt. That's based on our residual concern for the problems that we had that we discovered prelaunch. The work in the control center has, this last shift, centered mainly around reviewing various I-film options having as an aid to the folks that are working the experiments problems in the vehicle. I think that's just about it from us. We're in good shape, like I say, and we're intending to go the full seven days and it looks like from an orbiter and crew standpoint we're doing real well.

PAO OK, thank you, Gary. Mr. Cremin, would you have something to say?

JOSEPH CREMIN (SPACELAB MISSION MANAGER) Yes, thank you. Good morning. Spacelab 3, as it presently stands of the fourteen investigations that should be up and operating, has ten that are in progress (two of which are continuing to be in a troubleshooting mode). The drop dynamics module, we feel that we have made progress in terms of isolating where the problem is and we continue to pursue that avenue in terms of trying to isolate and prepare and get DDM back online. In addition, the IONS, which was started yesterday, has failed to respond to command and there's troubleshooting going on to see if we can't bring it back online. The wide field camera, as you are aware, depend upon the airlock and the airlock not being in a mode where we feel that we can do anything further than we have already done with the airlock. And the ATMOS, I'm sorry to say, has had the laser fail and even though it obtained spectacular data, and I do mean spectacular data, if you've had a chance to talk to the principal investigator I think you'll really see this in terms of the data (garble) he has in his opinion of what's been done. And naturally we do not operate the DEMS. The primary emphasis experiments for the flight, the materials processing, all three: the fluid experiment system, the vapor crystal growth sysem, and the mercury iodide crystal growth are performing fine. The FES has noted some unusual growth patterns or interesting growth patterns inside of the crystal and considerably faster accumulation of crystal. The vapor crystal growth is doing fine. In fact, all three of the primary emphasis experiments are just doing excellent. The DDM, as I mentioned before, that we have isolated the problem to an electronics tray A and there's an IFM that's presently in work that'll be uplinked to Taylor to pursue that on his shift today. GFFC continues to record information on its scenarios. We've kinda gotten to an accounting system that calls full or completely run-to-execution scenarios. We've got seven of those. We've got partials, otherwise. In terms of the GFFC, in the scenarios that are put together for it, they are fundamentally in one hour increments such that when there is any temporary halt in the scenario, the data that we have already recorded is good data and the experiment proceeds from that point on. Aims: As you are aware we did have crumming from the rhodent food bars. We've spent a good deal of effort coming up with a revised procedure that I believe all of you will have seen on television. In terms of the food bar changeout, Norm Thagard and Lodewijk Van den berg performed the operation, did it in spankingly good time, and believe that we have updated all of the food bars for all of the rhodents that are in the cages. And that was well executed and it was a good procedure. Bill Thornton was taking photographs to record for postflight analysis. Those activities and the nature of the food bar blowout we had seen. AFT: four subjects continue, four people contine to operate it. I noted as I came over here that apparently Bill Thornton had some sort of a problem with wearing the accelerometer, if I understood it right. But I don't want to really get into that until I know

more about it. It was just kind of a passing comment on the air-to-ground. UMS: we continued to do calibrations. There is some additional troubleshooting to identify or try and see if we can increase the airflow through that. That should continue in the future. We count on at most for about twenty-five of the seventy-two occultations, kind of divided into the number of suncals and the number of the sunsets and sunrise observations. I would suggest, that if you haven't already, Barney Farmer would be an extremely good person to talk to related to the results, in spite the laser failure. In terms of Aurora, we have completed five of fifteen geometic activity, however was somewhat low and not as spectacular as it was on the earlier days. And that basically concludes my summary. I'll open the floor for questions.

PAO OK. Thank you, sir. We'll take questions in Houston here first and we'll start with Dave Dooling.

DAVE DOOLING (HUNTSVILLE TIMES) Dave Dooling with Huntsville Times. Joe, on the DDM: what is in tray A and what component or components do they suspect and what will be involved in Taylor trying to fix it?

CREMIN There tray A relates to a, as I understand it, the automated control and it's two or three power supplies that are internal to that that are suspect presently.

DOOLING OK, are these the inverters that were discussed in earlier briefings on the DDM?

CREMIN I'm not sure what George covered last night, whether he got into that. (garble) This has kinda been a string of progressively isolating further and further down to where the problem is.

DOOLING OK, if it is in one of those boxes,one of those black boxes,they don't have any spares on board, do they? If someone opens those boxes can they...

CREMIN No, we don't have spares of that but there's,you know, cables that we could replace. There's other things that we could do if it's of the nature of - compatible with the equipment that we have on orbit.

Yeh, I believe the way that IFM goes is if you happen to find the short in one of the invertors you go ahead and rewire it such it's taken out of the loop and the other invertors provide enough power.

DOOLING OK. Ok, so it's not a replacement, it's basically you will be hot-wiring the system

CREMIN Right.

JULES BERGMAN (ABC) Jules Bergman, ABC NEWS. Joe and Gary, I think this is for both of you. Overmyer was overheard on the IFM, the intercom leak, to say, " We've got feces up here in the cockpit. You better get on it, guys." What did Sam Poole actually rule last night, that there was no medical hazard? And that's for Gary. And Joe; Norm Thagard - I heard him this morning during the television saying that changing out the rat trays was inadequate even with vacuum cleaners, that particles got by him of fecal matter.

OK. You want me to answer that first?

COEN I don't know what Sam ruled last night. I can tell you what the surgeon's position is today that, after viewing the rework procedure and after listening to the operation today, they said that they have a little level of concern as anybody would for hygienic reasons but that they're confident that wearing the masks and allowing the masks to remain on for the thirty minute period that they're doing allows the Spacelab to clear the air well enough that they're confident that that's an effective way to go. The, as far as the ruling last night, though Jules, I don't know exactly what the ruling was. We did work awfully hard during the night though. After understanding the situation in the vehicle and after receiving Bob's comment we worked awfully hard to improve the procedure. We have improved it to a level where the crew and the people on the ground think it's about as good as it's gonna get. So, I would leave it right there. All I can really say is what the surgeon's told me on my shift. Last night, I don't know that the ...

BERGMAN OK, second question, Gary. How do you think the fecal matter and the food particles, presumably got to the cockpit of the Orbiter struggling against a positive airflow from Orbiter to Spacelab?

COEN It's probably not a function of the airflow. My guess is that it was on somebody's clothes and carried back up into the Orbiter. That's only a guess because we haven't discussed that with the crew about how much travel there's been back and forth or how much extra care they've taken with the clothes that they're wearing. So, my guess, Jules, is that it was just carried across.

PAO Craig Covault.

CRAIG COVAULT This is kind of a perspective thing. And really, I'd like comment from Lead Flight and Lead Mission Manager. It seems to me, it's been kind of a struggle for the manned flight community to accept animals onboard, anyway, and I have a feeling

if this thing has hit the fan in Spacelab it's only .(laughter) its only a harbinger of how it's gonna hit the fan when the crew gets back in the astronaut office. Shuttle management sit down with AMES and Spacelab management on future life sciences flights involving animals. What do you think really is going to be the long term effect to your experience here - not so much long term but just mid term next two or three years in terms of flying animals?

CREMIN Carlton, naturally this is speculation. I think when we come down we'll have a throrough review of the problems and we'll make changes that'll go ahead and terminate or eliminate the particular problems to the best extent we have right now. I don't have any data that will take place. I think that in the best interest of NASA, in terms of the life science community and understanding man's capability for long term flights for whatever purpose, I think the research is essential and that we really find the way to make it right with all the participants in it. And I'm optimistic that we will be able to do that.

COVAULT Well, Joe, to follow up on that aspect of it. Do you think it's gonna require perhaps another shakedown crew's prior to getting into the life science's activities where you're really trying to do science with animals?

CREMIN Personally, and it's speculation purely,I don't think so. I think we're learning. I think we've got procedures in place. I think that we've taken steps during this flight to go ahead and reduce, if not completely eliminate, some of the problems we have been having. And that these will manifest themselves into modifications to designs and changes that will make the temporary fixes that we have a permanent part of the safeguards that we keep.

COVAULT Gary..

COEN Craig, I think this flight being really a verification flight test of the animal holding facility is going to teach us a lot in terms of how to bring the two sides that you recognize as being polarized, maybe, a little closer together. I would hope that we will be able to use this very test and the information that we get to make it into a progressive coincidence between the people are on one side saying," Here are people and here are animals and they'll never be compatible. It remains to be seen, honestly, but we would hope that we're getting enough information out of this flight and that we will be getting the experience so that we can use the in-flight comments, the post-light comments, all the data that we've collected and start bringing some of these to a little closer contact and a little better understanding of what really needs to be done.

I think you have to take a positive approach to these things and I think you have to use your knowledge and build on it.

CREMIN (garble) I'd like to punctuate that word, verification. That's the whole name of the game is to fly it, understand it, make sure we've got the wrinkles taken care of,

and I think that's what we're seeing.

COEN And I don't think this fight really represents the dichotomy. The people onboard working the raft are well trained, they're very excited about it, they are physicians so it behooves them to be in that same genre. I don't think you are really on this flight you can really find the dichotomy. Of course, people on the other hand: you and I and everybody, we want to remain clean. We want to be hygienically clean and that is a concern as we operate here on the ground. That's a human desire.

CREMIN Jules, I skipped over an answer to one of your questions. Do you still remember it?

BERGMAN Partially.

CREMIN OK

BERGMAN Aaah...

PAO If Jules doesn't I still do. (laughter)

BERGMAN And add to it to which I would add: Joe, do you think, actually, it will ever get to be a pets in space scenario as Bill Thornton humanistically said or animalistically said yesterday?

CREMIN He said that. He said that on a number of occasions. I think it will take a while. But I think if there's going to man-permanence in space and stuff like that over a long term that I think you'll eventually have that.

BERGMAN Other than animals as experiments? (pause) In space sickness, for example?

CREMIN If there's someone that's going to be on orbit in a vehicle for many months one almost has to make many concessions to the individual, certainly from viewing capability, from activities, from entertainment, ..you know, the normal things you do on your weekend to make his stay more palatible and more suitable for him. (garble) I'm not advocating an agency policy or anything like this but it certainly would have to be a consideration.

BERGMAN And would'nt you concede that animals as space sickness tests are passe'? That astronauts have demonstrated that roughly half of people get sick? Along the lines of the best test of human's being man, himself

CREMIN I think I would more defer that to a life science division. I think you're getting me to speculate in areas that I'm not too fully equipped to answer that question.

PAO Mr. Lyons.

DICK LYONS (NEW YORK TIMES) Dick Lyons, New York Times. Mr. Cremin, yesterday one of your colleagues rated the somewhat ill monkey at two Garns. Has that been cleared up, is he alright now? I mean ,is he...

CREMIN He still continues to not eat nor drink as much as the other. I don't know if you saw some of the video of primate number 2. He appeared to be thoroughly enjoying the flight. The other one appears to be somewhat enjoying the flight. We did open up the window that permitted light to come into there such that there could be attention to the animal, like crewmen passing so that he is aware of that. That did seem to improve his eating and drinking habit.

LYONS While the numbers are small. Doesn't that mimic what American experience in weightlessness (forgetting about the Soviets). I mean, it's about fifty-fifty, isn't it.

CREMIN I guess Gary would have to answer that. I think it's something like that.

LYONS I mean, approximately, as Jules mentioned a minute ago, half of those who have flown in space on the American side have become ill, give or take a few.

CREMIN I've heard that and that's accurate.

LYONS Well, doesn't too monkeys - they're obviously a limited scientific sample but doesn't the experience tend to mimic what's happened with astronauts?

CREMIN I'd venture to say I think so. I think even in terms of zero-G flight's preflight, the one that's doing so well now didn't respond that well to the zero-G fight. (garble) So you're even seeing that correlation that you can't test on the ground and know it.

PAO Carlos Barnes, Houston Chronicle.

CARLOS BYARS (HOUSTON CHRONICLE) OK. I want to ask you a couple of questions, Cremin, about the rat feeding. You said they're still having crumbing. Is that from the food that was already in the cages. What was the condition of the food bars that you were trying to put in the cages. Was it as crumbly, flakey, dusty as the original bars had been during the first feeding or is it like you had thought retained its humidity and consistency? And then I have a followup question about your procedure.

CREMIN OK. It's the latter. The food that is coming out of stowage that was installed by Norm Thagard this morning is as expected in terms of humidity content. The crumbling is still related to the food bars that have or were in the process of being removed from the wrap itself. (garble) So, we are not putting in another problem as far as the quality of the moisture content of the food.

BYARS OK. At least until it dries out.

CREMIN Dries out, if it dries out.

BYARS OK.

CREMIN There is still conjecture in terms of why is that food that's coming out so crumbly now? That, we have'nt got a good answer for.

BYARS You commented earlier that this was a good procedure and yet it seemed to take and you said it was done in good time and yet you had three, four astronauts tied for the better part of an hour on something that should have taken one man a few minutes. How do you arrive the verdict that this was a good procedure?

CREMIN Very simply. It worked. In that regard. Bill Thornton, in terms of the future, I don't think we'll need the third crewman. The second crewman, I think we will go ahead and take that we will have to have two of them doing that in the eventuality that there's any particulate that has to be caught by the vacuum cleaner to catch it. But, to me, the most important thing about any procedure, expecially when it's been related to some difficulties is that the thing worked.

BYARS But, they still had food particles and feces adrift, at least in the lavatory, if not all the way up into the cockpit. It didn't seem to work too well.

CREMIN Well, I can't speculate on the comments that came before that, you know, in terms of related to which operation with the rat the thing was related to. But from what I saw, and naturally I looked at this thing with tremendous interest, was that the way that we have set it up even though it has graduated to a two-man operation, it's something that when we get back we'll look at how we get it back into a one-man operation.

PAO Dan Molina (NBC)

DAN MOLINA (NBC) Is there some concern about the RCS right now as perhaps an unscheduled hot-firing being planned. I heard some snatch of conversation about the temperature this morning?

CREMIN That was the the injector temp on Jet R4D. The injector here has failed on that particular jet. And we were discussing at one point this morning about where that temperature was going to stabilize. The report to me was that the temperature had stabilized at 55 degrees which indicates that that's not going to be a problem so we can go without that particular heater the rest of the flight and not worry about undertemping the valves in that jet. In fact, the particular vehicle attitude we're in in this flight is advantgeous there because the Earth tends to keep the back of the vehicle warm which has allowed that jet temperature to stabilize out and now it's flat. There were some comments made this morning by the prompt folks that they didn't that was going to be a problem for them.

PAO Frank Seltzer (CNN) and then we'll go to the Cape for questions.

FRANK SELTZER (CNN) Gary, a couple of quick questions. One, has the galley been fixed? Is that working now (garble) to smack it?

COEN If you'll remember yesterday I reported that they had banged the sill on the side of the food galley and that had allowed them to pump out water. Well, they haven't had to bang it again. It's still providing hot water.

SELTZER Second question to either one of you, what's the poem?

COEN That's kind of an in-joke. As you probably know, we're able to see almost every - see on telemetry almost any activity in the vehicle. So somebody noticed this morning some activities and kind of as a joke we let them know that big brother was watching.

PAO OK. We'll go to Kennedy Space Center now for questions.

JAMES FISHER (ORLANDO SENTINEL) This is James Fisher with Orlando Sentinel. Clarification on the ATMOS. Even though the laser problem is developed, is it collecting any data or is it completely shut down?

COEN Right now, it's presently in a stand-by. And I think it's questionable whether it would be operated again during the mission.

JIM BARBEE (NBC) For Gary Coen. Is there any likelihood we had a report from Bob Overmyer and also from Fred Gregory that the feces and the food was getting into the cockpit about twenty to thirty minutes after it came out of the cages, is there any likelihood any of this waste could get into the shuttle's instruments, computers, or any of the flight hardware?

COEN No, Jim. The closest it can get to flight hardware are some filters in the cabin air circulation system so that the expectation is that it would get caught in those filters similar the filter that you have at the endlight of your stove or heater at home. It should catch that stuff and hold it at that point. The fans run continuous, which is of course, different than the heater that you have in your house.

BARBEE OK. To follow up. It costs you about a quarter of a million dollars each time to go out and land at Edwards and then come back here. I understand you have a Lear jet standing by to bring the rats back and all of the laboratory is set up to kill the rats after they land. And they say that there is no need to set the laboratory up out there. You have a time limit of six hours, I understand, when you lose all of the data you are collecting on the rats and that's going to be pretty close to push that and get it back here with a Lear jet: to get the rats off of the Shuttle, get it back here with a lear jet, get them out into the laboratory, and then sacrifice them. But what I'm asking you is, with all the good weather and everything, are we ironclad, locked in; are we going to Edwards or is any consideration being given that the weather's great here and in view of the fact that you have these rats to sacrifice are you considering the possibility of coming into KSC?

COEN Jim, that are with us on this flight didn't influence the selection of the selection of the landing site. As you may know the reason that we're landing there is because we want to use the time that we have available to us to study the effects on the long term effects we got on the last landing - that's having to do with the brakes and the tires.

BARBEE Yes, I understand that, Gary. So there's a possibility that by landing at Edwards that the rats may get a reprieve?

COEN That's not ...(laughter) I don't think that's what he said, Jay. (garble)

Governor Coen? (laughter)

COEN Next question, KSC.

MIKE LAFFERTY (TODAY) This is Mike Lafferty with Today. I was wondering if someone might elaborate on the problem with the IONS experiment.

CREMIN Presently, when the IONS was turned on it exhibited a mechanical jam. There are procedures in place to cause or to try and eliminate the mechanical jam. These were exected per procedure and were unsuccessful in terms of freeing it. There are additional IFM procedures that are going to be looking at the interfacing - resources both power and data that are provided

from the Spacelab to see if there is any item that can be noticed that might be corrected internal to the module. If there is any problem that is in there we will naturally fix it if we can. In terms of once we've gone through that - if that doesn't show anything that requires correction then we may have a situation where we have a hard failure within the insrument. If that's the case there will be nothing that we can really do to bring it back on line and I certainly hope that's not it.

FISHER This is James Fisher, again, with the Sentinel. I believe I remember hearing Bill Thornton say yesterday that the hardware development cost on the animal cages was somewhere around 10 million. Is that an accurate figure?

CREMIN I'd have to go the people that developed the hardware. I don't, I'm not privy to what that cost was but we can get that.

PAO OK. Thank you Kennedy. Back here. I owe Mike Meecham question in the back and then we'll move to the front row again.

MIKE MEECHAM (GANNETT MAGAZINE) Without regard to the well-discussed rats and monkeys. In looking more at just the hardware angle of this, can you in an overview, both of you, from the Shuttle side and from the Spacelab side; try to tell us what you're learning as far as the operations of a working laboratory in space and what problems when you go for the next flight your're going to particularly pay attention to, for instance as far as how well you can run machines, furnaces, and that kind of stuff? And also, as far as how the crew has to work these kind of situations?

CREMIN OK. The items that we've seen in terms of some air flow that is sending the crumbling food bars into the module, the research and the holding facility has been designed such that its pressure is less than the cabin pressure. In some way there's something that has complicated that and permitted an outflow and the particulate to come out. Getting an understanding on that is the principle thing that has..

MEECHAM I don't care about the animals. I'm talking about the furnaces. I'm talking about the ATMOS. I'm talking about the IONS's problems. I'm talking about running the laboratory. I don't care about the animals. I'm talking about the main jist of this mission which is material science. What do you learning about how you can do this, you know, with a look forward to space station and the whole point of this kind of stuff?

CREMIN I think the prime emphasis is the materials processing. Those all are doing well in terms of their performance. There are some unusual growth features that are showing up with the FES that we'll have to get an understanding

of and the other investigations, I think, are performing as we expect them to. The environment that we are providing is meeting their needs. In terms of ATMOS, except for its internal problem with the leakdown of its pressure, I think it's worked swimmingly well throughout both in terms of the opportunities it had.

COEN I think from the orbiter side we're learning, at least operationally; we're trying to learn how to become good hosts to those activities. We do a lot of work between flights understanding the constraints imposed by the various experiments and we're working hard to develop capabilities that help the customer. I think you can see some of that in the operation over there and we're doing our best to be in this case a good platform for zero-G experiments. We're doing our best to accommodate the experiments requirements. So I think we're learning, in some cases as we go and in some cases real time, how to best accommodate what they need.

CREMIN Before we go any further I've got a response to Jay Barbery's question which is a little more detailed. The expectation is that we'll return the animals to the Kennedy Space Center about eight to ten hours after the landing. While all of the major changes in the organs and tissues will be preserved despite the added length of time some results related to hormonal changes will be lost. NASA scientists estimate they will be able to obtain about seventy to eighty percent of the data they would have collected from the landing at KSC. The flight data on feeding, drinking, and activity levels will provide a signficant amount of information as well. And we'll take a question from you, sir. Would you identify yourself?

TUNG DOCTRAING (VOA) I'm Tung DocTraing, VOA. I would like to ask you about the DDM. Doctor Taylor Wang has spent nine years to develop the module and to devise the experiment and it has been a shame that the module is not working. So how do you assess the chance of having the DDM in the operating condition and the fact that he has been concentrating on troubleshooting? Did it reduce his contributions yesterday to nil - contributions to other tasks in the Spacelab?

CREMIN The selection of Taylor Wang was brought about principally based upon his expertise with the drop dynamics module so his activities are heavily focused on the drop dynamics. He does support some of the other investigations, and these like the activities that we had with the wide field camera early on the amount of time that he spent, we're optimistic as long as we can have items that we think we can check and see if they'll work. I can't really speculate whether it will happen but all steps are being taken to see if we can't bring his experiment on line.

DOCTRAING I talked to Yushin Tran this morning. He said something about the power supply and the problem may be in the line, in the wiring, or something within the power supply. Is that true?

CREMIN Yes. That's my understanding

DOCTRAING With the power supply, can you do anything about to fix that?

CREMIN If it's a question of replacing certain wires I think that's a capability that we have and we're bypassing.

DOCTRAING Yes. And I talked to another (garble) person. He said that Doctor Wang can still do something without the power supply to the unit. Is that true?

CREMIN I'm not

DOCTRAING Just to salvage the experiment in some way?

CREMIN OK. I'm not aware but I would think that if we finally said that we can't that there was probably some things that we could do but I really couldn't comment on what those are. I'm not familiar with them.

CROEN OK. We'll take some questions here. Just for everyone's information we've acquired signals through TDRSS and we are getting some TV of the crystal grow. Carlos.

BYARS Carlos Byars, Houston Chronicle. Mr Cremin, now what is the nature of this mechanical jam on the ION experiment? Is this some sort of cap that fits over it that has to be opened up or what is the nature of the mechanical jam?

CREMIN There is a gear train you know, the ION's has two detector plates. One of which rotates and thoughout the course of it's operation will rotate 360 degrees. And by reconstruction postflight of the ION trace paths through it, burns which way the IONS were coming from their charge state and other information about that. There is a mechanical drive train that increments this thing through the 90 hour operation period that it has. The indication coming back from the software the experiment has reached the point where it can not move, part of the procedure to go ahead and free this is to try a number of commands forward, a number of commands backward. We have seen these things happen during ground tests, but have always been able to free it by using the existing procedures.

PAO Carlos, follow up?

BYARS Yes. If you have seen these problems in ground tests, even though you were able to free it, was there any consideration given to building it in such a fashion that you didn't have the problem?

CREMIN In terms of the experiment and the amount of time that was available before flight - wasn't time to make any fix, if they knew what would be a better design for it.

BYARS When did you start working on this project? Or when did the (garble) start working on it?

CREMIN IONS was originally selected for Spacelab 1. There were prototype, there were engineering models, there were a number of versions of the investigation.

PAO Craig Covault.

COVAULT Another perspective, this time on the malfunctions that you've been seeing with the equipment. All large projects like this are kind of held hostage by lead times of many years. If you look over the course of the Shuttle here in the last two to three years, we've seen a lot of Mission impact malfunctions where small hardware have suffered electrical or mechanical - difficulties perhaps due to the hard ride to get off the solids, or it launched. In hindsight, Joe, would you argue on future planning for Spacelab missions to maybe build some beefier equipment, less swisswatch type engineering, and maybe dip into the weight margins you have on Shuttle to beef up this hardware?

CREMIN Some items by their very nature like the detector in the IONS, in order to have the fine granularity, has to have a really percise ratcheting system. At times, weight will not help you in that case. I think the environment that the experiments see is well understood, basically well documented, and testing as appropriate to see that you withstand it. In some cases it is done, and in other cases it isn't done. I think, you know, to air on the side of conservatism, certainly is the way that one should do that. In terms of whether there is a lesson, I think when you have one of a kinds or two of a kinds or three of a kinds, you'll always be frought with - situations where, you will have problems or failures in that. I think just by the nature of how many you build. It's like if you take a consumer product, like a refrigerator, I don't know how many millions of units there are that are developed and tested and worked over a period of time, before you have one that you go there and you expect it to do everything that it's supposed to do for fifteen years.

COVAULT Well, okay, I concur there. But are you - if you take five or six Spacelab missions in the next three years here -

CREMIN Yes.

COVAULT - Some level of that nature. Is a 20 percent malfunction weight acceptable?

CREMIN Well, I think if you talk to the individual experiementer, it certainly isn't, and that's where the impact is felt. NASA went to, when we went into the Spacelab, to a means of assigning or providing the principle investigator, with more and more of the responsibility for the hardware development, operation and the decisions in that regard - these are PI calls, or principle investigator calls, in terms of how they design the hardware. From a Mission standpoint, we look at them from a safety and an interface compatability with the Spacecraft, and also with the other experiments that are onboard. And it's more a question to an investigator - that agree to which he either takes weight to go ahead and absorb it

PAO Frank Seltzer, I owe you one question if you could make it quick and we'll cut out.

SELTZER Real quick. Joe could you with the ATMOS at about a third of it's 72 takes, you got two out, two shakey, the other one doesn't seem to be running, some up to speed, some not - how would you categorize the success so far, percentage wise? What are you getting as to what you expected?

CREMIN Yes. I certainly would like to see it higher. I think, if you look at the investigations that are onboard, that we're doing very well, in reality. Even though there are some, and there will always be casualties in terms of spaceflight, and I don't mean casualties in terms to someone being hurt. But certainly, casualties in terms of objectives that are missed in that.

PAO Okay. Thank you, on that note we'll call it a morning

END OF TAPE