APOLLO 5

PRE-LAUNCH PRESS CONFERENCE

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2:30 P.M.

Participants

William C. Schneider, Apollo Mission Director, Office of Manned Space Flight, NASA
Rocco A. Petrone, Director of Launch Operations, Kennedy Space Center, NASA
George M. Low, Manager, Apollo Spacecraft Program Office, Manned Spacecraft Center, NASA
Col. William Teir, Manager, Saturn I/IB Program Office, Marshall Space Flight Center, NASA
Col. Royce Olson, Director, Department of Defense Manned Flight Support Office
Christopher C. Kraft, Jr., Director, Flight Operations, Manned Spacecraft Center, NASA
Eugene F. Kranz, Apollo 5 Flight Director, Flight Operations, Manned Spacecraft Center, NASA

Mr. King: The countdown for the Apollo 5 mission is proceeding toward a planned liftoff time of 2 p.m., Eastern Standard Time, tomorrow, Monday, January 22. To cover some brief logistics, here in the News Center we will be open all night tonight, phone 783-7781, and we will have people available with up-to-date information on the status of the mission and the count throughout the evening and the early morning hours. We will be coming up, probably just about the time we come out of the built-in hold, with the commentary which starts at about T-3 hours and 30 minutes in the count. During the morning hours we will have up-to-date information on how we stand up to that time before the commentary begins. There will be a postlaunch conference at Press Site 2 at T + 60 minutes, and there will be a post mission conference some 7 1/2 to 8 hours following liftoff. This will take place in Houston at the Manned Spacecraft Center. It will also be piped in here at the News Center and at the Press Site at the Cape.

I would now like to introduce the five gentlemen here at the Cape and we have two gentlemen standing by in Houston who will participate in this afternoon's conference. From my right, here at the Cape, we have Col. Royce Olson, who is Director of Department of Defense Manned Spaceflight Support Office. Next is Mr. Rocco A. Petrone, who is Director of Launch Operations for the Kennedy Space Center and Launch Director for the Apollo 5 mission; Mr. Wm. C. Schneider, who is Apollo 5 Mission Director, Office of Manned Space Flight, NASA Headquarters. Next, Mr. George M. Low, who is Apollo Program Manager from the Manned Spacecraft Center. And finally, here at the Cape, Col. William Teir, who is Manager of the Saturn IB Program Office at NASA's Marshall Space Flight Center. And to clarify right away, I believe the name is correctly spelled in front of Col. Teir, and incorrectly spelled in several other places, it is T-E-I-R. Correct? And standing by in Houston we have Christopher Kraft, who is Director of Flight Operations for the Manned Spacecraft Center, and also from MSC, Mr. Gene Kranz, who is the Apollo 5 Flight Director. Now we will start with Mr. Schneider, please.

Mr. Schneider: Good afternoon, ladies and gentlemen, we have just completed our examination of all of the vehicles and the systems, the status of the network, the Department of Defense support forces, the aircraft, and last, but not least, the weather. And everything is as planned for our 1400 liftoff tomorrow. That's 1400 Eastern Standard Time. We did pick up the count this morning at about--at exactly--10 a.m., and as of right now, everything is proceeding smoothly and as planned. Now we will still plan our 6-hour built-in hold that we have always in our schedule, which ends at 10:30 tomorrow morning.

Now, this is the maiden voyage of a very complex vehicle, and it is a very busy plan, or very good plan, I should say, of about six and a half hours duration. During that time we will be firing the descent propulsion system, or the DPS (dips) as you may hear if referred to. We will fire that twice, the first one occurring just after four hours into the mission. Following the second and last DPS firing, we will stage the vehicle, and do a "fire in the hole" burning of the ascent propulsion system and then finally on the last orbit we will do the second and last firing of the ascent propulsion system, a firing to depletion. That will take approximately six and a half hours if everything goes as planned and will conclude the preplanned portion of the mission except for one activity I should mention. We still will be conducting one of our major exercises. We hope we will be monitoring the status of the S-IVB until it quits, and we do expect that that will last after that six and a half hours.

We will also have a couple bonus activities that we will gain out of this mission, the first one being an exercise designed to safe the S-IVB vehicle which we will do on the first rev. And secondly, if the mission goes as we had planned, as described in the press kit, we do hope that we will have some consumables left and we will then go into a series of preplanned activities similar to what we have done in the past with the Agena, which, if you recall was at the end of the planned mission we did exercise some of the systems on the Agena to see how it would behave. Similarly, in this mission, we will be exercising those backup systems that we have not previously used and we will be using some commands that we had not used, just to see what does happen and we will be doing some reaction control system firings in some phenomenal situations. Essentially I believe that takes us up to twelve or thirteen hours, if we have enough consumables on board at the end that we can do everything.

In addition to that, since this is a relatively complex vehicle and it is a maiden voyage, the people in Houston, the flight control people, have come up with some preplanned ideas on what they would do in case they had various types of postulated equipment failures. I would like to say that we have these preplanned procedures but they do of course assume a failure, a type of failure, and they do of course assume that we do have sufficient time to activate the backup modes, and some of these do require some pretty fast stepping on the part of Gene Kranz and his people. So, while we have these modes, these alternate modes, and we are looking, we are grateful that we have them because many of these alternate modes will allow us to achieve most of our primary mission objectives, even in the event of some failures. I do caution you, however,

that while we have the modes available to us, it is not at all certain that if we are called upon to exercise them that we will. I think that is about all I've got to say about this mission, and I guess we can turn it over the Questions and Answers.

Mr.King: Okay, we are ready to proceed with questions here at the Cape. We will also come to you all in Houston in a short while with questions from there.

Mr. Dederer: A couple here first. One, how did the fueling go on the LM, and I understand it has been considered quite hazardous because of the involvement of the SLA and I just wondered how this fueling event went.

Mr. Schneider: Doug, I consider that it went very well. It took a little longer than we had laid out because of extra precautions, but I believe that it went very successfully.

Mr. Dederer: Another one, how long will the LM remain in orbit before it is expected to come back in?

Mr. Schneider: Chris, why don't you answer that, or Gene?

Answer: Primarily because we do not know the orbit the spacecraft will remain in after we get through, and certain tolerances on the cutoff condition. It will probably be anywhere from days to weeks.

Mr. Salestead: Could you elaborate a little bit on what you did today as far as preparations were concerned? Did you fuel the LM for example?

Mr. Petrone: The LM fueling was completed actually some days ago, I think it was about a week, you know you lose reference of time--we are working around the clock. But in terms of today, we say we picked up the count at 10 o'clock this morning, that is Eastern Standard. Up to that period of time, we had been doing many checks which we do in any normal recycle. We came out of our countdown demonstration, we dried out the bird, drained it, dried, go back in, make leak checks, and at the time we picked up this morning, we started installations of batteries. These are batteries that have to be activated some 48 hours before the mission. These are put in, or are being put in now, proceeding to a launch vehicle power up in about 3 hours on into power transfer this evening. The activities we had planned today are part of the normal count and a recycle coming out of our operation late Friday night. All the propellant loading of the spacecraft has been completed prior to picking up the count. The only loading we do during the countdown is aboard the Saturn IB with the liquid oxygen and liquid hydrogen.

Question: I wonder if perhaps Mr. Low might be the right man to do this. If you could run down those systems, subsystems I suppose, which are not on LM-1 which will be on the LM which goes to the moon?

Mr. Low: The first one that comes to mind of course, is the suit loop of the environmental control system. Since we are not flying men, we do not in LM-1 include the complete environmental control system, but only that part that is needed to cool the systems and enough oxygen to replenish the gas supply in the cabin. There are a number of other systems which are either not on the LM or are inactive. We are not carrying radars on this flight. Bill points out we do not have the landing gear, but by and large, the vehicle is a complete vehicle. It is particularly complete so far as the guidance and propulsion systems are concerned. The test is, insofar as LM is concerned, primarily a test of the structure, the guidance system, and the interactions of the guidance system with the propulsion system.

Mr. Bergman: For Chris Kraft, I think. Chris, how tough is this mission as compared to past missions and what are the especially critical flight portions you are worried about?

Mr. Kraft: I think I have to say that from the standpoint of the work that the spacecraft has to do, as well as the people on the ground, it is probably one of the most complex missions we have ever flown. The guidance system that we are using is literally the system which we are using for the descent and ascent from the moon, and we have had to "Kluge" that system so that it is able to work in earth orbital flight. This means that the platform had to be displaced. We had no means of realigning that platform. We have to be very careful of the orbits we fly. This vehicle is meant to fly from here to the moon and not around the earth, and therefore its instrumentation system is a rather peculiar one in that we have no means of recording the data. This means that we have to keep our maneuvers over our tracking stations and try to get as much coverage as we can on each one of these revolutions. You put all this together, it is indeed a very complex mission from the standpoint of controlling the trajectory and monitoring the system.

Mr. Dodd: Did I understand Mr. Low to say there is no test of life support systems in this particular mission?

Mr. Low: Only a partial test of the life support system. The portion of the life support system that feeds into the pressure suit in a manned flight is inoperative in this mission. Thoroughly tested? Yes, it will be tested first of all in a very comprehensive ground test program. There is a

LEM test article, LTA-8, which will be subjected to all of the conditions of the space environment in a large thermal vacuum chamber. And, the complete test of the environmental support system will be carried out in that test faiclity.

Mr. Orlando: Just a simple question of terminology. Have you put back the "E" in LM?

Answer: LM is spelled "LM," for Lunar Module.

Mr. Orlando: Yes, but in the actual lunar flight, does the "exploration" come back or not?

Mr. King: The terminolgy remains the same all the way through. The E is still out and will remain out.

Mr. Benedict: Is crew fatigue still the determination for cutoff tomorrow, or would darkness halt the countdown, and also, what is the turn around situation if you have to scrub tomorrow?

Mr. Petrone: Crew fatigue as we see it now is the essential factor. Darkness is not. Our window not being based on any of the conditions of daylight for recovery and so on, crew fatigue will be the determining factor. That is something that has to be judged in real time, based upon what is going on, what the problems you face are. Therefore, we have used the word "approximately" in the press kit. What was your second question? Recycle? If for some reason we don't put cryogenics aboard, that would mean, let's say, at 3 hours 30 minutes--T minus three thirty--tomorrow we could recycle to a Tuesday count, depending on the problems, of course. If the problem could be fixed in the remaining time, we could recycle to Tuesday. Beyond that, we would have to judge in terms of what has to be done. If we put cryogenics aboard and get fully loaded with our propellants, then our recycle on this one is going to be four days.

Mr. Benedict: Do you put the cryos in at T minus 3 hours and 30 minutes, after you pick up the built-in hold count?

Mr. Petrone: When we pick up the count after the built-in hold, the first step will be to start the loading of liquid oxygen. That will be 10:30 tomorrow morning if we stay on our present schedule. Within about ten minutes of the time we pick up our count we will activiate our liquid hydrogen ground system and start flowing into the bird. When you start moving into that you go into a four day recycle. Let's say four days. The window on this

one not being set to a recovery time leaves us some flexibility as to whether we schedule for morning or afternoon. We have to look at the total work to be done. We use the word "approximate" on that four days too.

Mr. Benedict: Just to clarify, when you said you would recycle for Tuesday prior to propellant loading, does that mean a launch time on Tuesday or would you pick up the entire 30 hour count again.

Mr. Petrone: We could hold at T minus 3:30 - three hours and thirty minutes - we could hold at that. If something came up that would force us to go into the bird, then determining how far you have to go in, we could hold for 24 hours where we now have our six hour built-in hold.

Mr. King: Let me clarify this a little more. The cryogenic loading of the liquid oxygen and the hydrogen goes from about T minus 3 hours and 30 minutes down to about 55 or so.

Mr. Lewis: Did I understand you to say, Mr. Low, that there would be oxygen in the cabin, that you would fly this with oxygen in the cabin rather than nitrogen?

Mr. Low: No, we are flying with nitrogen in the cabin, but any makeup during the flight will be with oxygen.

Mr. Lewis: In that connection, has this vehicle been fireproofed as North American is trying to fireproof the Apollo.

Mr. Low: LM-1 has not been fireproofed, because it is an unmanned flight. The LM vehicle as a whole has been fireproofed in much the same manner as the command module has and we have completed successfully a flamability mockup series of tests with a complete LM model to prove that this type of fireproofing has been successful.

Question: A couple of questions as to staging the S-IVB stage. Is this the first time you have dumped sizeable quantities of liquid hydrogen and liquid oxygen into space, and what will happen to them? Will they remain in that state or will they float away, or what?

Mr. Teir: In this program this is the first time we have actually had a planned dump of the liquid oxygen and liquid hydrogen, and as to just exactly what would happen to them, I think we need a physicist to answer that for you. Someone else may be able to help me, but there is no real problem connected in any way with this, because, of course, all of the other flights, even though you do not purposely dump, it is dumped at some time if the vehicle breaks up or if you have a pressure failure. So we see no problem as far as the dump of LOX or hydrogen is concerned.

Mr. Alexander: What are the Agena-like maneuvers you are going to try with the S-IVB?

Mr. Schneider: We are not going to do any maneuvers. If I misled you by mentioning Agena, forgive me. We, of course, stage and have the ascent stage part from the descent stage and we will as part of our second firing fire the ascent stage to depletion. We will be firing the reaction control system under some abnormal situations with the small thrusters and the attitude thrusters, and we will be doing some stabilization checks using the attitude thrusters, but there are no major burns scheduled in that period.

Mr. King: Just to clarify, George, you mentioned S-IVB. Does that satisfy the answer. He was obviously talking about the lunar module.

Mr. Low: May I correct a statement I made a moment ago. In LM-1 we are not replenishing with oxygen in order to maintain cabin pressure. We are loading with nitrogen. We are not reloading beyond that point. It's different from the way we handled Spacecraft 17, where we did replenish.

Mr. De Long: What was the nature of the power problem with the computer power supply yesterday?

Mr. Petrone: I can handle part of that, and maybe Bill Teir would like to add more. There were two failures during the latter part of the countdown demonstration. The two failures were both in the same power supply tray, however, thorough analysis Saturday morning and Saturday afternoon, both at Marshall Space Flight Center and here, indicated that the two failures were not related and it turns out that the particular circuitry of the electronic components, you might say, experience a random failure. It has been repaired and put back in action. I believe it went back on the line at two o'clock yesterday, so the computer has been up almost 13 hours now. We are making some special measurements and watching the current trends and they have indicated no problems as far as we are concerned. I think we have it totally solved. Bill, you may want to add to that, because Marshall has done quite a bit of work, especially during the evening hours, I know, on that one.

Mr. Teir: In general, I can't add too much. I might say that failure analyses, both at Marshall and here, have indicated that they were both problems with the regulator, component problems two different components, one on the input side, a rectifier there, and the other was a diode on the output side. They can't be tied together and Rocco indicated that the

computer has been on since yesterday, I believe he said at two o'clock. The power supply has been operating, actually, since eight o'clock yesterday morning where the problem was, and it looks good now. We have no reason to feel that there is going to be any problem remaining.

Question: I note that in the press kit it says that the manned LM will weigh 31,700 and advised the weight of the vehicle to be flown tomorrow. Does tomorrow's weight include compensation for the gear that has been removed?

Mr. Low: Yes, it does.

Mr. Fontag: What is the total, exact weight of LM-1 flying tomorrow?

Mr. Low: 31,530 pounds.

Mr. LaMont: For Col. Petrone. I know there has been a constant fight out at the pad with rust and...

Mr. Petrone: The Chamber of Commerce wouldn't agree with you there.

Mr. LaMont: I know there have been a lot of measures taken. Are you satisfied that the preventive, or corrective, measures, whatever they were, suit your needs? And could you explain a little bit about what was done?

Mr. King: Are you speaking generally, or are you talking about Apollo 5?

Mr. Petrone: We do take normal preventative measures. I will answer this in part. Then I will have Bill Teir add some things that Marshall, in turn, also did. There are normal preventative measures to prevent our atmosphere here in Florida from taking over, certain nitrogen purges, dry gas, dry nitrogen, things of that nature. On any vehicle we do run certain inspections, and on Apollo 5, because of the time it has been here, there were certain, you might call them more thorough quality inspections set up, and we in turn, with Marshall, made some very detailed checklists. We go in periodically and look at various things. You have to keep in mind that the vehicle essentially is purged. We do keep the tanks under pressure, with dry nitrogen in there. The engines are purged. You keep a constant dry pad pressure in there. On our inspections, I think we were very well pleased and found nothing to indicate the state of the hardware was deteriorating. Bill, I'm sure you want to add to that. I know it was of great concern to the people in Marshall too.

Mr. Teir: Yes. At the time we foresaw that the vehicle was going to be on the pad some time, we had our own designers at Marshall and each of the contractors' designers, the quality people, and the operational people here at the Cape get together and come up with very detailed inspection criteria, to look at those areas you wouldn't look at if you made a normal inspection of the vehicle. After coming up with these very detailed criteria we conducted the inspections, using both the quality and the operational people, and after our first inspection we were quite pleasantly surprised that there was no more deterioration than there was. This was made in April and May--on the various parts of the vehicle. And each three months, at least every three months, we continued to make these inspections. Each time what we found was less than the time before. We had to change out no operational components due to corrosion.

Mr. Howard: This is a followup on this question of the weight. Could you tell me what is the weight of the components eliminated from this flight? The things we mentioned before.

Mr. Low: I can't give you a specific answer because there are some deletions and some additions also. For example, we are carrying a LM mission programmer, a box that carries out the functions of the man. We are carrying a lot of instrumentation on this flight that we will not be carrying to the moon. So there are a lot of plusses and minuses and I don't have with me details of that. I should also mention that some of the structural components, the skin is somewhat heavier on this LM than it will be on later ships. So to answer your question specifically, it takes a lot of numbers I don't have with me. To give you a general answer, I mentioned the weight for this LM as 31,580 pounds. The expected weight of later ships is going to be as high as 32,000 pounds.

Mr. Wilford: A couple of related questions, Mr. Schneider. What are some of these alternative missions if you get into orbit and have some trouble? The second question is, if you have trouble in orbit, how long can you delay and still get in all four engine burns?

Mr. Schneider: Those are both flight questions and I would like to ask Gene Kranz to answer them if he will.

Mr. Kranz: We have several alternatives. Our first alternative starts during launch phase. If for some reason we should have any spacecraft problems or launch vehicle problems during the launch phase, we have two systems we can call upon to execute both descent stage ignitions and both ascent stage burns with the "fire in the hole." Once we get into orbit

we still have these two sequencers we can call on and perform over any site. This will essentially satisfy a good portion of our objectives within a period of time of about four and one half minutes. We have other alternates based on certain spacecraft failures. Mr. Low talked about the LM mission programmer. This is a very critical component in the spacecraft. We have techniques developed to work around certain relay failures within that LM mission programmer. Generally, from a standpoint of slips in the mission, we have two opportunities for spacecraft separation. The first one is over the Carnarvon site in the first revolution and the second opportunity is over the continental United States--excuse me--over Carnarvon, in the first revolution, is the first LM separation opportunity and over the continental United States at the end of the first and the beginning of the second revolution. Thereafter, we have one relatively critical maneuver we must perform very close to schedule. That is the descent propulsion number one burn. This occurs on the third revolution over Carnarvon. Once we get past that burn we can essentially slip the remaining two burns, the descent number two burn and the ascent number one burn, which are all one long sequence of about 13 minutes in duration. We can slip that one revolution. If we accomplish that one, then we can come back and slip the ascent burn number two one revolution, so the one major maneuver that a good portion of the mission is based on is the descent propulsion system number one maneuver over the Coastal Sentry and Carnarvon site in the third revolution.

Mr. King: I understand there are no questions from Houston, so we will continue here at the Cape.

Sue Butler: I'd like to pursue the weight just a little further, Mr. Low, if I might. For instance, could you reassure us about progress being made in the weight of the rendezvous radar, which we realize won't fly this time, but we understand is one of the major overweight items, plus any others. Could you give us a status report.

Mr. Low: I'd like to correct one comment you made. I don't think that the rendezvous radar is any more of a weight problem than any other component, or the LM or the whole Apollo spacecraft. In the Apollo spacecraft program we have bounced against a weight limit for components, all systems and all modules of each spacecraft. On the other hand, we do have this weight limit well defined and well under control so that we know that with the weights we have now, measured with weights that we are predicting for those things that have not yet been weighed, the performance capabilities of our propulsion systems and with the amount of propellants we can carry we have a weight situation that is very tight, but manageable, a weight situation with which we can accomplish the lunar mission.

Mary Bubb: Were there changes or modifications made on the booster as a result of the fire?

Mr. Teir: As a result of any damage in the fire there were no major modifications of any type made, or I should say there were no modifications as a result of damage in the fire. We have made modifications on all three of the stages--or the two stages and the instrument unit--since moving it to Pad 37. I would say a good portion of these are mission required changes that must be made and others are changes from R and D information that we get as we continue through the program, and information from other flight tests, flight tests of 501, but none are due directly to any damage in the fire.

Mrs. Bubb: The question was, were there any major changes made overall?

Mr. Teir: No, there were no major changes that I would call major changes in vehicle design made.

Question: For Mr. Schneider or Mr. Low. As I recall, LM-1 was originally scheduled for delivery on November 16, 1966, and it showed up in late May 1967. In addition, it was originally scheduled, I believe, to be launched in the second quarter of 1967 and it is now being launched in January 1968. Could you run down the problems that caused this long delay?

Mr. Low: I think I can speak specifically only about the problems that have occurred since I have been on the Apollo program, which is since about April of this last year. At that time, LM-1 was scheduled for delivery to KSC, I believe, in May. It was part way through with checkout activities at the factory. This checkout was completed, and the only significant problems that we had at that time concerned the special instrumentation for LM-1, the so-called development flight instrumentation. We had some harness problems, we had to replace the wiring harness in that, to assure ourselves that our measurements would hold up through the flight.

Following the delivery, and during the checkout period here at the Cape, the one significant difficulty we had was concerned with a large number of leaks in the propellant system. Now, when we say leaks, we ought to be very careful to define what we are talking about. Because we are talking here about minute leaks, measured with pressurized helium, escaping extremely slowly through some of the joints. I made a calculation at one time and I forget the exact numbers, but taking the kinds of leaks that we had, and if you had to think in terms of quantities we know, it would take several years to fill up a milk bottle, for example. We are talking in terms of numbers like 10^{-7} or 10^{-8} cc per second. Yet, we had specifications for the system that indicated

we had to fix those leaks and this took quite a bit of time. Once we had fixed the leaks, LM-1 was a very good spacecraft in going through checkout here at the Cape. Once we got into the actual test and checkout procedures, it went extremely smoothly and very well, and we have had no significant problem.

Question: Then perhaps Mr. Schneider could tell us then, from November 15, 1966, to April, why there was that delay.

Mr. Schneider: I'm afraid I can't--I'm sure we can supply you with that information later.

Mr. Bergman: A double barreled question for Rocco Petrone. Do you really mean, Rocco, that you will launch in total darkness tomorrow night at seven, eight, nine, or ten, all things being the same, if you are proceeding toward a good launch setup?

Mr. Petrone: Yes. You went down a little further--total darkness will not affect our ability to launch.

Mr. Bergman: Right up to midnight or 1 a.m. as long as the crew holds out?

Mr. Schneider: The determining factor will be crew fatigue, and at both here and at Houston and the DOD activities. We say crew, we mean the total crew supporting the mission--launch, flight--but that is the determining factor, Jules, not the specific time of day.

Mr. Bergman: Okay, Second question now. For Bill Schneider, on the mission itself. If your mandatory mission objectives are not met, you don't get a good flight burn, or a flight burn plus DPS and ascent stage burns, does that mean you will have to refly with a LM-2 unmanned, and if so, how will that influence the manned flight schedule for the remainder of 68 and 69?

Mr. Schneider: Well, I think, as was announced by Mr. Webb in our scheduled activities for the year, we do now presently plan a LM-2 on top of the 206 vehicle. So, the schedule as outlined some months ago does include a LM-2 flight as part of the planning.

Mr. Bergman: Conversely, Mr. Schneider, if everything goes well on the LM-2, the present flight or mission profile, what do you hope to prove or find out with LM-2?

Mr. Schneider: LM-2, just like the 020 spacecraft, is configured such that -- let me retract and start all over -- LM-2 is configured so that it can duplicate the mission of LM-1 and the plan for a LM-2/206 mission precisely duplicates the LM-1/204 mission so if everything was achieved, and everything was successful (and we will not be able to tell that for some time) we would hope to be able to delete that flight, the LM-2 flight.

I might add this. This is completely in consonance with our previous planning, where from a spacecraft standpoint, not a launch vehicle standpoint, the 020/502 flight spacecraft objectives were identical to the 017/501 flight, so that either one would satisfy our spacecraft objective. However, obviously on 502 we'll have the 502 objectives by themselves.

Mr. King: Question was LM-1 and LM-2 the same type of spacecraft? Mr. Low answered YES.

Question: We have heard a lot of talk today about random failures and repairs, problems with regulators, relays thus and so, and I believe Mr. Teir was pleasantly surprised how little damage was caused by the Florida weather. I want to ask just one question and to answer it, I guess Bill Schneider is it. How confident are you?

Mr. Schneider: I would say I am as confident in this mission as I have been in any. We always prepare ourselves completely and we never go forward into launch with any reservations. We recognize that in any flight, there are certain things that you cannot predict beforehand, but believe me, if I had any reservations or if any of the gentlemen up at this table had any reservations, we would be putting out an announcement saying we were not going tomorrow.

Albert Salestead: Is the second ascent burn the lunar abort simulation?

Answer: No, the first ascent burn is a simulation of the lunar abort and it occurs -- it is initiated while the second descent burn is still in progress.

Question: Following up Jules Bergman's question about a launching in darkness, I believe we have the same interests at heart. Mr. Schneider postulated

crew tiring based on an 8:00 a.m. launch as about 4 in the afternoon. Have you, among yourselves, decided when the crew will get tired?

Mr. Petrone: That has to be decided in real time. So much depends on what the problem is. You see, you can get certain rest. Depending on at what stage certain things happen we could bring in certain people later and we can do a certain amount of rotation. It is really an item we have to keep our fingers on throughout the time we are proceeding in the count, whether or not the fatigue problem is one that will bring us to the point of saying we are not going any further.

Mr. King: For the benefit of those mutual interests we will attempt to get it before the 11:00 p.m. news show.

Mr. Bergman: Following up these wrong questions and my questions, if you were making a random ballpark guess, what would your guess be as to when crew fatigue might become such a determining factor that you would say you'd better scrub? What time of the evening, would you say?

Mr. Petrone: Jules, really, that's not a thing to be determined by a computer. It is to be determined by people on the floor at the time. And that judgment just has to be made right there, depending upon what your problems have been and what our forecast would be for proceeding, the status of support, and there is so much involved that you cannot put an arbitrary limit on it. Sometimes maybe these lunar windows help us, for if its 11 o'clock you're through, whether you are ready or not. But in this one, without a window set by other factors, it is the crew, and I say both launch and support around the world. It will have to be determined in real time.

Question: You'd like to go at two o'clock tomorrow afternoon?

Mr. Petrone: Yes, that's when we're going to go.

Mr. Schneider: If you're asking if we're going to go through and nit pick it, the answer cannot be that we are going to be able to do that, because not only do we have to worry about Rocco's crew, but we have thirteen hours of flight activity afterward, and we do have all of the flight controllers, particularly the Goddard network people who will be on the line, so if we run into troubles early in the game, then Rocco's postulating about going on into a late night launch becomes a possibility. If we are proceeding down toward a two o'clock in the afternoon launch the same general type of crew restrictions -- four, six, eight hours, something

on that order -- is a possibility. If there is going to be any night time launch I think you will be able to condition yourself to the possibility about the same way we are. You'll get long notice on it.

Mrs. Bubb: If you get a good LM flight and a good second Saturn V, what do you think the chances are of manning Apollo 3?

Mr. Schneider: That is one of those qualifying questions. You have to sit here and think. The spacecraft is being configured and the launch vehicle is being prepared so that eventuality could take place, but I wouldn't want to say anything about the probability that we will be able to do it until I hear post flight from George Low that the spacecraft, the LM, has passed all of its objectives, and from the launch vehicle people that they are satisfied. I cannot say any more than yes, it is a possibility. We are not precluding that option, but it is one that we will have to exercise.

You see, we have a launch vehicle objective in there too. We have to not only have a successful 501 command module test and we are tomorrow, I hope, going to have our successful LM flight. We still have to get that second successful Saturn V flight under our belt too.

Question: Two questions. One for George (Low) and one for Gene Kranz. First, Gene, at what time will you and your crew be coming aboard tomorrow

Mr. Kranz: The majority of us will be sleeping in the crew rest quarters here in the control center and upon notification that they have picked up the count after the built-in hold and completed the initial set of command checks which will occur immediately after picking up the count, we will receive notification that they have picked up. We should be on station sometime between three hours -- T minus three hours -- and T minus two and a half hours.

Question: And George, if all test objectives are met, can the LM be considered man-rated after this flight or will it also have to depend on the outcome of LTA-8?

Mr. Low: Certainly we'll have to depend also on the outcome of LTA-8 and a number of other tests -- ground tests that are going on and will continue to go on for some time yet. We have not yet completely qualified all subsystems for manned flight in ground tests.

Mr. Benedict: Mr. Schneider, in your recent Washington press conference you mentioned the possibility that even if you didn't achieve orbit you might

still be able to carry out a lot of the LM mission objectives. I'd like to ask Gene (Kranz) how this could be possible, just what the options are here.

Mr. Kranz: They are basically during the launch phase. The powered flight phase is ten minutes in duration. From about two minutes and thirteen seconds, or about the normal staging time, we enable the -- what we call the -- abort monitor routine. From this period on until we insert into orbit we have three possible alternatives. We have a contingency orbit decision alternative similar to that which was discussed in the 501 and which exists in the 502 mission. They are essentially the same. In addition to this, if for some spacecraft or launch vehicle problem after staging we should end up faced with an abort situation, we can execute what we call a LGC suborbital sequence. This particular sequence pressurized the RCF system, separates the spacecraft from the launch vehicle, initiates a very short descent number one descent propulsion system burn; we'd have a short coast time, would reignite the descent propulsion system, go to a 100 percent throttle on the descent system, an abort stage, and light off the ascent engine. We'd again have a short coast sequence and reignite the ascent engine in a period of twenty seconds or sixty seconds, depending upon which sequence we choose.

I'd like to point out that what you have in your press kit says we are going to do certain maneuvers at certain times in a planned flight. Once this flight gets underway, because of the trajectory limitations as well as the computer limitations, it may well require a great deal of real time flight planning to reshape that flight plan and we won't want to be judged by the flight plan you have in your press kit. There are many ways of accomplishing the objectives of this flight and we may well have to choose them once we get into orbit.

Question: There was one thing I didn't quite get clear earlier when they were talking about after you load the cryogenics -- start loading them -- at T minus three hours and thirty minutes. You said after that if you had to recycle you'd have to recycle for four days, but I wasn't sure for how long you could hold during that period. What would be the maximum length of time?

Mr. Petrone: The quantities in our storage containers -- I'm assuming no other problems and that it is just a question of replenishment -- we have automatic replenishment going on and we also have planned to re-top our storage containers. Let's say there was a problem other than that at the pad. We then could cycle in transfer trucks to re-top our large

storage containers -- they now have some 125,000 gallons of liquid hydrogen and liquid oxygen, so I think you have to get back to the fact the problem comes within the bounds of crew fatigue. We will have enough hydrogen and LOX in our containers to take us through the window of the human factor.

Mr. King: As is the usual case in Apollo, we have several gentlemen who need to catch a plane, and I see Mr. DeLong has the only hand up, so we'll take that as the final question.

Mr. DeLong: What are your weather constraints on launch and the long range forecast? Does it look like . . . .

Mr. Petrone: We see nothing in the forecast we got here a few hours ago to indicate that there should be any problem to launching tomorrow or in the immediate days ahead.

Mr. King: Before we finish up, Col. Teir wanted to make a brief statement.

Mr. Teir: I wanted to make one comment in answering the question on changes after 204. I did not mean to indicate that we have neglected any lessons learned. We have made several safety reviews and have made some minor changes in the vehicle as a result of those. These are changes that are considered minor in circuitry and things like that, but no major change, and none as a result of it. We have tried to apply the lessons learned to a launch vehicle of this type.

Mr. King: One final matter of logistics. As far as transportation to the press site tomorrow, bus transportation will start at about T minus four hours in the count, and the last bus will depart from here at about T minus sixty minutes. The buses will also stop at the south gate of the Cape on the way out. Thank you very much.