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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

# PRESS CONFERENCE

# ON

# THREE MILE ISLAND

Middletown, Pennsylvania

April 2, 1979

11:15 a.m.

7904050198

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P R O C E E D I N G S

MR. FOUCHARD: These are very difficult circumstances, ladies and gentlemen, and we hope you will bear wit us, and we will try to bear with you.

We have some important information to convey to you this morning. We want to do it in an orderly fashion. And after Mr. Denton has made his opening remarks, we will take questions in the same manner that we have taken them ir the last few days. That is, I will recognize you.

I do ask you to be patient.

Now here is Mr. Harold Denton.

MR. DENTON: I would like to give a brief status report on some of the items I've covered previously; but the is one issue I want to deal with first.

We have decided to issue a bulletin regarding this accident here to all the other B&W design plants which are operating. I think there are seven other operating stations designed by B&W at five sites. These bulletins do require the licensee to inform us in ten days of the steps he's taking to assure that this type of occurence won't be repeated.

Two of these sites already have resident inspect at those locations. We have now sent inspectors to the oth three sites. So in effect we'll have resident inspectors a all sites that have a design similar to Three Mile.

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Let me turn next to the status of Three Mile. The plant is still being cooled by steam generators, the normal way it's been cooled for the last several days. The fuel temperatures are still dropping.

Yesterday there were no fuel assemblies over 500 degrees, and only four over 400. This morning's temperature map indicates there are only two elements now reading over 400 degrees.

Let me mention next the bubble size. There's been a lot of interest in the bubble. The equation used to calculate the bubble size is sort of a first order approximation based on Henry's Law. It's shown dramatic decrease in bubble size. The number that you get from just running the numbers out today is on the order of 50 cubic feet as opposed to 850 cubic feet a few days back.

There are a lot of competing effects. I don't want to be stampeded into concurring that the bubble is actually this small. We're trying to do more sophisticated analyses to be sure that the equations that are used to calculate bubble size properly include all effects.

I think it is certainly reason for optimism. It is certainly going the direction I'd like to see it.

QUESTION: Why do you think it happens --

MR. FOUCHARD: Let him finish his statement, please.

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MR. DENTON: One other development in that same mode: the oxygen generation rate that I was assuming yester day when I was reporting on the potential detonation inside the vessel is it now appears to have been too conservative. There's an emerging consensus of technical opinion that the -- for situations such as this where there's high oxygen overpressure in a vessel, that the oxygen evolution rate is very low, and our numbers for the rate of oxygen yesterday -- I think I quoted a number on the order of one percent a day is very, very conservative, and the actual rate is much lower than that.

Let me turn to a few other questions I'm routine. asked about: recombiners on the containment atmosphere. The recombiners are all hooked up, and there's been a lot of attention to making sure they were leak-tight, and they were operationally tested and ready to go.

The isolation valves function properly. That would prevent any out-leakage from the containment if there were malfunctions in the recombiner. I have authorized the recombiner operation to begin at any moment that it's -- that they can start it up. It takes about two hours to warm it up and put it into operation.

I don't expect any leakage offsite as a result of operation of the recombiner, but we do have special monitoring ongoing during this period.

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The hydrogen level in the waste gas storage tank has been found to be about 56 percent. The rest of the gas in that tank is nitrogen. We don't intend to start venting back from the waste storage tanks to the containment until the recombiners are fully checked out and their effects are known.

And we'll be careful about pumping back into the containment those gases that are now held up outside.

QUESTION: Could you go a bit slower, please?

QUESTION: Louder, please.

MR. DENTON: We've had the first instrument failure due to radiation levels inside the containment. The radiation levels inside the containment are quite high. One flow transmitter on the inactive loop is no longer functioning.

We surmise that this is because of the effects of the radiation on the instrumentation, and we expect there may be a continuing instrument failure because of the radiation levels inside.

Offsite dose levels appear to be dropping. I've looked back at the dose rates in the plume as a function of time. When the incident began the readings in the plume varie from a low of about .01 mr per hour up to 4 mr per hour. Yesterday the maximum was down to 1.5 mr an hour. The maximum readings this morning are down to .1 mr per hour.



We've taken dosimeter readings from 37 locations

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around the site that represent the past 24 hour period ending late yesterday. The highest reading during that 24 hour period was about five miles northeast of the site was 1.1 mr. The next highest was .04.

Most of the --

QUESTION: What? What was the first one?

MR. DENTON: The highest reading of any of these dosimeters for this period was 1.1 mr. The next highest was .04 mr. Most of the dosimeters read extremely low, in the range of less than .05 mr for that 24 hour period.

I just cite these numbers to show that the general radiation levels offsite are declining.

I've also looked into whether any other fission products, other than xenon, have been found. There have been one or two samples that have been reported to contain iodine. These samples are near the threshold, the reported concentrations are near the threshold limit of detectability. And we're checking these out.

I think I've covered the highlights, and now I'll

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take questions.

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MR. FOUCHARD: All right. We'll move from this side to this side, and we'll take your questions one at a time.

QUESTION: About the design defect, the bulletin that you've now given for the inspection of these other nuclear plants with a design type similar to Three Mile Island, does that mean you have discovered a defect at

MR. DENTON: No, sir, it describes what we now know. It tells them what -- essentially what is known up here about the accident and asks that they look at this accident and report what steps they are taking to prevent the same thing from happening.

It's not -- we haven't learned yet the exact causes of this accident.

QUESTION: Dr. Denton, sir, if as you say, the bubble size has dramatically decreased, has it decreased to the point where you now no longer consider it to be a serious danger?

MR. DENTON: As I said, I don't want to be stampeded into agreeing with this number. The equation that's used to calculate it is a Henry's Law type equation. We didn't focus on the accuracy of that calculation as long as it wasn't changing. Now that it's shown a dramatic drop in bubble size, it does not include solubility considerations.

So I'm having the staff right now look into the details of that number, and I hope to be able to agree with it

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or not in the near future.

QUESTION: So you're not in a position now to tell us all here that it is a safer situation than it was yesterday?

MR. DENTON: Oh, I think it is safer than yesterday. I certainly agree it's going down. I just want to agree with you that it's going down all the way.

QUESTION: Can you say how necessary it is that an evacuation will be needed?

MR. DENTON: I think the evacuation plans are controlled by the state. My own view is that my own concerns with regard to the potential for a hydrogen explosion to the bubble are diminishing, not only because the size of the bubble is going down, but also because we have found -- because the assumption we used for the oxygen evolution rate was too conservative.

Therefore, the input of oxygen into whatever bubble is there is not as great as we had thought it was. And so the approach to a combustible mixture is much further off than I had estimated.

QUESTION: Dr. Denton, can you explain how the news about the bubble seems to have gotten so much better so quickly? Has there been some acceleration in the process, or have things been happening over the past 24 or 48 hours that we haven't been told about?

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MR. DENTON: There's been no change in the process.

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The dramatic change in the number has caused me some skepticism. There are at least three ways to get gases out of the primary cooling system when you look in detail. One way is the pressurizer spray system, and that's the system that's been in effect for sometime. It's the one that I've usually described.

There's also the letdown flow which is the source of the continuing release offsite; it also removes the dissolved gases from the primary system. And then there's also leakage from the primary coolant plant seal, which takes out dissolved gases.

So, it may be there are good physical reasons that the bubble shape changes; it reaches a slightly different elevation in the containment; the agitation of the water, and the ability to transfer soluble hydrogen is just changing enough so that this comes about.

I didn't expect such a rapid change, and that's one reason I want a careful look at it.

QUESTION: You don't know which of these three processes to point to as the one most responsible for this change?

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MR. DENTON: No, I don't.

QUESTION: Mr. Denton, you said that of the

37 locations --

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QUESTION: No, no, no. The dosage -- the monitoring stations; you got a reading of 1.4 MR per hour five miles east of the station; does that mean there's a hot spot someplace?

MR. DENTON: No. I think that's the closest locatic and predominant wind direction.

QUESTION: Where are the seven other plants?

MR. FOUCHARD: I think we need to clarify on that.

QUESTION: Seven other plants, where are they located, please?

MR. DENTON: Let me read the entire list of plants in the U. S. designed by B & W that are in operation.

QUESTION: These are the seven, sir, that you were referring to about the --

MR. DENTON: I'm going back to the B & W; Oconee I, II, and III operated by the Duke Power Company in South Carolina; Rancho Seco, operated by the Sacremento Municipal Power District in California --

QUESTION: Where?

MR. DENTON: California. Davis-Besse I, operated by Toledo Edison in Ohio; Three Mile, which you know about; Arkansas I, operated by the Arkansas Power and Light Company in Arkansas; Crystal River, operated by the Florida Power Caompny in Florida.

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MR. FOUCHARD: I think it should be noted that

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the regular inspectors from NRC have been assigned for some time at Oconee in South Carolina and Arkansas I and Arkansas II. So the sites we're talking about for resident inspectors are Rancho Seco, Davis-Besse, and Three Mile Island, being the --

QUESTION: Is the information -- I thought you said go ahead.

QUESTION: Dr. Denton, do you have any idea now when you're going to go to cold shutdown?

MR. DENTON: Well, if we're satisfied that the hydrogen explosion potention has diminished, there's no time frame pressure to cold shutdown. The core is being quite adequately cooled in this present mode, and before we go to cold shutdown, we want to check out the heat removal system.

It would be pumping highly contaminated water outside the containment. Before going to that mode we would want to be sure that there were filters put on all possible leakage paths, and so forth.

And since the present system is cooling the core quite adequately, if there's no time pressure because of things like hydrogen in the vessel, to cease this mode of operation -- I would be content to let this one go until we have the RHR system throughly checked out and operational. And I don't have an estimate today as to when we would transfer.

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QUESTION: Dr. Denton, what are the levels of radiation in the containment building and the level of hydrogen in the containment building?

MR. DENTON: The radiation level in the containment appears to be at the dome about 30,000 R an hour. Now, this containment has an exceptional amount of fuel in the structure because it was designed to withstand airplane crash impacts back there in the original design. So it has quite a high attenuation coefficient.

The levels outside the containment are on the outside -- they range from 1 to 5 an hour. The rates inside the containment are measured by the dome monitor; they're on the order of 30,000 R and hour. The dose rate measured outside the containment is 1 to 5 R an hour.

The hydrogen content of the containment atmosphere as measured this morning is 2 percent.

QUESTION: Just to follow up that question; once you get the reactor cooled down, you're going to have a big problem decontaminating the inside of the containment. Can you give us some idea how that process will work?

MR. DENTON: No. You're quite right, though, in the decontamination and the ability to cope with the amount of radioactive fission products that are in the containment is going to be a long time problem. We've got people looking into that aspect, but we have no plans to --

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QUESTION: Could you tell us how you measure -- what are the parameters that -- for measurements that go into the bubble size?

MR. DENTON: Let me ask Roger Mattson who is one of our division chiefs to describe the technique.

MR. FOUCHARD: That's M-a-t-t-s-o-n.

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MR. MATTSON: I didn't hear the question.

QUESTION: I wanted to know, you had an equation, so you have data you put into equations. I want to know how you obtain the data for the equation.

MR. MATTSON: The question was how is the data that goes into the equation to calculate the size of the bubble obtained.

The data is obtained from instruments on the pressurizer in the reactor system. The measurements are very simple straight-forward measurements, and they only give you an indirect measure of the size of the bubble. The measurements are the pressure and the level in the pressurizer.

QUESTION: But if the hydrogen bubble is larger -- has the pressure gone up or down or what?

MR. MATTSON: The pressure has held essentially constant. That doesn't mean it's the same number all the time It means it's within a control band all the time. And within that control band, you look at differences in pressure and compare them to the differences in level. And from that you can infer the volume of a compressible gas contained somewhere within a system.

QUESTION: Over here, please.

QUESTION: If the oxygen is coming from hydrolysis why do you not have a simple stochiometric mixture? Why were your estimates on oxygen conservative?

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MR. MATTSON: Our estimates we believe were conservative because the predominant gas in this volume in this bubble is hydrogen. When you account for the significant hydrogen backpressure, then you can show that the oxygen that would penetrate the bubble would be considerably inhibited, much lower than we estimated. And that is one of the possible mechanisms for a change in the rate of bubble growth, or the change in bubble volume.

That mechanism would be recombination of oxygen and hydrogen through quiescent process rather than through the flammability process, and that may account for some of the marked decrease in the measured size of the volume. We're studying that very closely at the moment.

QUESTION: A question to Dr. Denton:

In instruments that failed because of radiation, what instrument is it? What does it do and what is the significance of this failure?

MR. DENTON: There is no significance of this particular instrument failing. It's a flow transmitter on the inactive loop.

But it just indicates that we should anticipate that there may be an occasional other instrument type failure with regard to instruments of this type. If you know that the pump is drawing electrical current, you know that it's

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So this particular failure itself doesn't affect our ability to monitor and control the facility.

QUESTION: If the other instruments were to fail, at what point would you have the problem?

MR. DENTON: I mention it because it's something we need to be concerned about and look forward and try to anticipate. It's the only instrument to date that failed and our supposition is it's because of the high rate of radiation.

QUESTION: We couldn't understand that last answer at all. Did I understand the gist of it was that the gadget that failed was not an important one?

MR. DENTON: That's correct.

There's no significance to the delay whatsoever. I told my staff that I didn't want to authorize operation until we are firmly convinced that the thing has been properly installed, leak-tested, that there was no instrument malperfo ing. And they have just been going through the night and testing the system, testing the isolation valves. And I guess yesterday when I used the term "midnight", I didn't mea to say it was going to be initiated at midnight, we thought it would be initiated by midnight. And they had it pretty much ready to go early this morning, but we decided to wait until the day shift came in and relieved them and then a new crew start over, warm it up, and put it into operation.

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QUESTION: If the bubble measurements prove to be accurate, are there any other major obstacles to cold shutdown?

MR. DENTON: No. If the bubble measurement decrease proves to be accurate, there are no hydrolic type obstacles to cold shutdown. There is the continuing issue of contaminated water, and we've had to make sure that whatever way we cooled it down didn't cause leaks of this primary coolant water somehow outside.

QUESTION: You just used the word -- "orders to my staff" was the phrase. Does that mean that you, yourself, are giving orders and calling the shots as opposed to the executives of the utility?

MR. DENTON: Let me try to clarify the regulatory role.

We've always said the applicant must propose and we dispose. In this case there is an unequivocal understanding between the plant and I that any significant change of the plant's status, the cooling systems or anything else, the potential for routine releases, we will concur in before they take that action.

QUESTION: How long will it take to verify the equation?

MR. DENTON: I don't know. We've got people back at headquarters and our resources at the national labs looking at it now. I would hope to have a better feel for what our

mpb5 people think about it this afternoon.

QUESTION: Can you say for sure the heat of the core, although decreasing --

QUESTION: I have a question about the hydrogen bubble.

When we've been talking about volume, is it at all possible that the volume of the hydrogen bubble is decreasing but the oxygen is becoming more concentrated?

MR. MATTSON: We've looked at the mechanisms. There are a number of hypotheses Mr. Denton has stated. All of them have been able to see oxygen as opposed to hydrogen at the same rate. So there is not a concentration problem.

QUESTION: Dr. Denton, could you explain what is it --

MR. DENTON: I've been asked to explain the bulletin. Copies of these bulletins will be available. And it doesn't contain any information that we've not discussed previously.

QUESTION: Could you tell us now, this day, how much is the maximum radiation anybody in the public might have received as a result of this incident?

MR. DENTON: I've ordered a number before of 100 millirem as what I call the maximum. This is a number we had developed yesterday or so. I prefer to treat that number as (inaudible). It's not been calculated using onsite

mpb6 meteorology. It's far away from the actual releases.

I think we can do a much better job of that to go

David flws back and back-calculate.

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QUESTION: Dr. Denton, as you well know, there are 600,000 people who would like to know today whether or not they're going to be asked to evacuate the area. From what you have told us, your statement is safer today than it was yesterday, your statement that there is some optimism, can you tell those people that we're closer to the point now where they will not have to be evacuated.

MR. DENTON: Well, I briefed the governor last night. I briefed him this morning on the events as I see the The decision regarding evacuation is the governor's responsibility.

QUESTION: What about the radiation in the containment.

MR. DENTON: The radiation in the containment is quite high. It's on the order of 30,000 R an hour.

QUESTION: What about on the ground around the plant. On the ground around the plant where people are living --

MR. DENTON: The highest dose that I've seen as a cumulative measure was one that was on-site. It was on a dosimeter that was placed about a day ago; so it hasn't seen the entire accident, but it saw a lot of it, with about 65 R above regular levels.

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QUESTION: Could you give us an estimate of the number of person rems --

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MR. DENTON: I haven't made any new estimates on person rems or maximum doses since the last time because the releases are -- the indications are that the releases are going down as measured in these plume samples that we take every day.

QUESTION: Early, before you arrived, one of your staff said that he believed that one of the vents of the valves that failed on Wednesday was apparently working again. It was being used to release some hydrogen from the primary cooling system; is that correct?

MR. DENTON: I guess I don't know.

QUESTION: What does the company have to lose rig now by ordering some sort of evacuation? You're telling us now that there's a high level of radiation, that certain things are going as expected, that certain things are going expected.

The residents of this area are concerned about a plant at which they were told nothing would happen. What do you have to lose by ordering an evacuation? What could -- otherwise -- you promised the people of this area -- you guaranteed that no such accident would occur at this time.

MR. DENTON: Let me go back to the high radiation issue; radiation levels in the containment are very high; however, radiation levels measured right outside of the dome are 1 to 5 R perhour. So the high radiation levels inside

david3 the containment means you ought to be very careful that you don't let the plant operate at a mode -- but the containment is performing its function.

So I don't want to overplay this.

QUESTION: But something could go wrong. Would you admit that?

MR. DENTON: Yes.

QUESTION: Why not evacuate?

MR. DENTON: Because evacuation is a decision to be made by the state government.

QUESTION: Have you advised them to evacuate?

MR. DENTON: No, I have not.

QUESTION: Why don't you make that recommendation?

MR. DENTON: Because I don't believe --

QUESTION: If it's exceedingly deadly if it was released, what would be the effects immediately in this area? What would be the effects in Middletown right now if that 30,000 rem were released right this minute?

MR. DENTON: It depends on the rate of release. I have not done the --

QUESTION: Let's say it was instantaneous.

MR. DENTON: I don't know. It could be --

QUESTION: Make a guess.

MR. DENTON: I won't.

QUESTION: Would you leave?

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MR. DENTON: I wouldn't leave, no.

QUESTION: In view of the fact --

MR. MATTSON: The question is: given the statement that we do not fully understand the course of events early in this accident, how can we ask the other licensees to take steps to prevent it?

We have some indication of the failures which occurred early on in the event, and we're getting a better understanding as we go along. There were failures of equipment and there were operator actions on the initiation of safety equipment.

By studying those scenarios and those failure possibilities, by inspecting them, and by training their operators for those specific kinds of failures under those specific kinds of circumstances, there should be large increase in the level of protection against this kind of event in the other facilities.

And I'm certain we will be in better communication with those licensees as we move along and we improve our understanding of the events leading up to the situation at this point. They will continue to improve.

QUESTION: Can you tell us what the major steps in that sequence were?

MR. DENTON: I want to add one more comment on the containment situation. The containment temperature is

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90 degrees; the containment pressure is minus 1 psi. There isno driving force in the containment to push gases out. Actually, it's negative with respect to the atmosphere. All the penetrations through the containment have isolation valves, and that's why I have no concem about about the gases that are in the containment. It's under a negative pressure.

QUESTION: Let me get this question in. I'm standing behind this light and you can never see me when I ask one. Is it so that for a time this morning the power company people, the people from Met Electric reported to you that the bubble was gone?

MR. DENTON: The question was did the power company people report to us that the bubble was gone.

I wasn't there this morning. Let me ask Roger what it was.

MR. MATTSON: The power company has made statements that the size of the bubble, in their opinion, is definitely lower than what they were measuring before. Now, the measurements of the bubble reported to us by the power company and observed by our people in the control room have never gone to zero.

I believe the most recent measurement was something around 47 cubic feet. Now, people might argue that's essentially zero. The manufacturer of the plant, Babcock & Wilcox, is of the opinion that the bubble is for all practical

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purposes gone, and will continue to decrease in size until it goes away.

If it's shown -- and we should know in hours -- that the mechanisms that they're postulating for this bubble's disappearance are in fact occurring and we can corroborate them with serious study, then there is still an advantage of continuing to operate in the mode we're in now, because there will continue to be dissolved hydrogen within the water, and it would be good to remove the dissolved hydrogen so that in the eventual depressurization of this machine you don't -- you follow hydrogen again, as you take the pressure off.

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The point I'm trying to make is there is not a clear line between here and gone, it's a gradual process and it can actually go back and forth. We're studying that very closely.

QUESTION: Can you say for sure that the heat of the core, although decreasing, will not continue to break down the molecular structure of the cooling water and create more hydrogen gas? And at what core temperature will the breakdown cease and how far away from that are we?

MR. MATTSON: It will not only continue, it continues in the normal made of operation for every power reactor. It is something that's designed into and account for in every power reactor. That situation we can handle. That's a normal thing to have happen in a power reactor core.

The situation that was difficult was starting from a hydrogen bubble that was trapped in the system, and we believe that there are indications that say that we may be improving that situation markedly.

QUESTION: Dr. Denton, you have indicated that enough is known about the sequence of events that caused this accident for the other power companies to take steps to prevent this from happening.

Can you tell us what that sequence was? What were the major steps, the failures and the operator errors?

MR. DENTON: I think those kinds of things we've

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discussed before. They are written down in the bulletin.

MR. MATTSON: The steps leading to the situation we're in today can be roughly characterized as the loss of feedwater on the secondary side of the power plant, a rise in pressure on the primary side of the reactor power plant, a discharge of coolant through the pressurizer, the initiation of the backup safety injection system, the emergency core cooling system which comes on automatically on high containment pressure, or loss of coolant from the facility, the continued high pressure of the facility with the high pressure injection system actuated, then the turning off of the safety injection system for some period of time.

QUESTION: Say that again, please?

MR. MATTSON: The turning off of the emergency core cooling system for some period of time, and shortly thereafter the reinitiation of the emergency core cooling system after a gas situation that develops in the reactor core for the emergency core cooling system by itself without a loss of cooling accident was unable to keep down the temperature in the core. That was finally stabilized by reestablishing the flow of the primary coolant by restarting the main reactor coolant pump, the one that is still running.



QUESTION: Given that set of failures, sir, can you categorically say that there is no design problem with the Three Mile Island type reactor?

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MR. DENTON: I don't think I said that. I think there probably will be changes in design following our review.

QUESTION: And that will require changes in the seven other sites, then?

MR. DENTON: It very well could require it. In fact, this is a routine part of the NRC's function, is to assure that when an incident happens at any plant, the other plants are checked.

QUESTION: That means you should shut down these plants and make the design corrections?

MR. DENTON: I haven't reached that determination yet. If we find that we can identify the cause and think it's warranted, we wouldn't hesitate to do so.

QUESTION: Could this happen at one of those plants tomorrow?

QUESTION: I would like to know if any of the other licensees are currently closed down or in a partial operating situation?

MR. DENTON: I think the answer is yes. I don't know the complete details. Unit 1 here at the site was down for refueling when the accident occurred and they are still shut down. I have heard that perhaps some of the other

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plants have shut down, but I don't have hard information on that.

QUESTION: In those steps where you said the

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emergency core cooling system was cut down, then was re-instituted, why was it shut down?

MR. MATTSON: It was a manual shutdown. It was initiated, to my understanding, because of the continuing discharge of coolant through the pressurizer relief valve, which is the situation that under normal circumstances we would not want to continue. And the judgment was on the part of the operating staff for reasons I'm not informed of this morning to shut down the high hand emergency core cooling system.

QUESTION: Dr. Denton, you have indicated that if in fact the hydrogen bubble is under control that there, then, is no rush to go to a cold shutdown.

Could you indicate what level of temperatures and pressures that you would like to achieve within the reactor so that you could then go through these other processes, and when you think that will be?

MR. DENTON: Well, if there's no bubble in the vessel, the temperature of the core can be reduced through the present cooling mode through the steam generator by just lowering the pressure and temperature since there's no bubble expansion to be concerned about.

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I see no need to rush to RHR, which is a backup system to the existing system. So the bubble question can be shown to be eliminated. I would expect to continue to

mpb5 cool the core in this method until we have really gotten the -- let me say you can go indefinitely in this mode provided the equipment that's operating this mode holds up.

QUESTION: But what temperature and pressure would you like to achieve to hold it?

MR. DENTON: I would like to see eventually the cold shutdown temperature, which is a temperature less than boiling, normally no higher than the 170-180 degree range.

QUESTION: Can the bubble come back once you get rid of it and start the process all over again?

MR. MATTSON: That was an earlier question.

If the free volume bubble goes away, there will still be hydrogen and oxygen in solution in the water. You can decrease the pressure of the system, then some of that hydrogen and oxygen is going to come back out of solution. There will not be near as much as when the bubble went away.

If we continue to operate, we take the hydrogen and oxygen out of solution so they do not generate as much gas upon depressurizing.

QUESTION: Dr. Denton, can you outline the step by step scenario to cold shutdown?

11 170 MR. DENTON: I can do that later. We've got several options under consideration, but we haven't selected a single step yet.

We would continue to operate the plant in a

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cooling mode.

QUESTION: If things continue to go as well as they have the last 24 hours, how close are you from cold shutdown?

MR. DENTON: I don't know how close we are. The core is cooling quite promptly in this mode of operation. If there were no bubble concern, we would have increased flexibility to lower the temperature of the core, and we are looking at that possibility.

QUESTION: How do you intend to clean out the damaged core, fuels, and to dispose of contaminated coolant and structures?

MR. DENTON: That's a long term problem to be faced after the core is brought to a cold shutdown. And it's going to be one that requires a thoughtful approach to keep the activity that's presently in the water, in the containment, in a controlled mode.

I am not able to discuss the plans today.

QUESTION: You said there were postulates of the ways the bubble could increase. Could you give us information on that?

MR. DENTON: I said there were several ways in which the primary coolant was releasing gases.

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QUESTION: I was asking Dr. Mattson.

Someone had hypothesized several ways the bubble

mpb7 had decreased.

MR. MATTSON: I said there were a lot of technical experts working on this, and there are several hypotheses around. All of them have merit. The most likely method for removing gas from this system to account for the apparent reduction in the size of the bubble, the bubble's volume, or the loss of volume, which is all hydrogen and oxygen, which is a normal process through the reactor coolant pump seals, when something's under control and does remove water from the system and removes the hydrogen and oxygen, those small bubbles (inaudible.)

The other is the spray line which is being run from the primary coolant loop up into the pressurizer to bring the gas out of coolant in its gaseous phase and then vent it through the vent line into the containment.

The third method is the normal let-down of the reactor coolant system from the makeup tank outside of containment, and that would remove the gas. That is the largest and most important contributor that we have, and we have some uncertainty about it. It could account for the rapid reduction if it indeed is going on as rapidly as the instruments would indicate.

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And again, I emphasize that's not certain. The indications are favorable, but it is not certain. We need a reconfirmation of the hydrogen and oxygen levels.

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QUESTION: 280 degrees?

MR. MATTSON: It's a hydrogen overpressure driving hydrogen and oxygen back into the water. Excuse me -- into the water instead of the --

QUESTION: Mr. Denton, you said you had to make a critical decision within five days or less; with this decrease in bubble size, is that still the same?

MR. DENTON: I view the --

QUESTION: What's the question?

MR. DENTON: The question is: is five days still a critical time because of the decreasing bubble size and the fact that we now know we were conservative in assuming oxygen evolution rates. The time frame has moved out considerably in time, and I don't consider the five days to be the critical termination point. It's much further out in time.

And if we can decide on the bubble issue, then the time frame is mooted.

QUESTION: Mr. Denton, you said before 30,000 rems inside the containment vessel. How does that compare with the radiation level in a normally operating reactor?

MR. DENTON: Oh, actually much higher.

QUESTION: What would be the level? What would be the level in a normal operating reactor?

MR. MATTSON: It depends on where you're at inside

david2 the containment.

QUESTION: Same place.

MR. MATTSON: Oh, very low up there, the normal output.

QUESTION: Approximately what?

MR. MATTSON: Tens of rem at the outside.

QUESTION: 10 rems?

MR. MATTSON: On that order.

QUESTION: Going back to the initial incident, this one Metropolitan engineer has said that a backup system to the feedwater system failed to activate when the first system went down because it was not properly aligned with the operating system.

That would suggest that perhaps the accident may have been avoided or at least minimized. Can you confirm that that backup system failed to activate, that the valve would not open as it should of because of improper alignment, and can you give us a reason as to why that occurred?

MR. MATTRON: You'll have to repeat it. I can't hear you from there.

MR. FOUCHARD: If you'd just be quiet, it would be much easier for us. We're trying to communicate information to you all. So --

QUESTION: One Met engineer has said that a backup system to the feedwater system failed to activate when the

david3 operating system went down on Wednesday morning, which would suggest that the accident may have been avoided or at least minimized.

Can you confirm that that backup system to the feedwater system failed to activate because it was not properly aligned and a valve did not open? And if you can confirm it, can you tell us why?

QUESTION: I didn't hear the question.

MR. MATTSON: The gentleman states that he has information from allegedly a person with the utility who says that a backup feedwater system, as I understand it, suffered an inability to come on when needed near the initiatin time of the transient.

That also is my understanding, and the source of the difficulty in the auxiliary feedwater system is not known to me at this juncture. It may be known to people at the plant. People have concentrated on how to get beyond the situation we're at now. We can go back and find out the answer to that question, whether it was the inadvertent closin of a valve that should have been open or the failure of equipment to operate when it was called upon because the equipment failed.

I don't think we know the answer to that question.



QUESTION: Is it the sort of valve that would open automatically because of a failure in the system?

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MR. DENTON: Let me clarify one thing for you; some of the parts of the feedwater system are not what we call safety-related. In other words, the plant is designed to be able to cope with failures of feedwater flow without any untoward events inside the core.

So it's the failures of safety systems that are of more concern to us than failures of conventional equipment for feedwater purification and development.

MR. FOUCHARD: All right. Two more questions.

QUESTION: Mr. Mattson, was the turning off of the emergency core cooling system and the subsequent turning off the factor of human error that you were talking about?

MR. MATTSON: There has been much controversy over the contribution of human error to this event. I can't sort that question out for you at this time: turning on the the emergency core cooling system, then turning it off, then turning it back on again clearly happened in my judgment.

QUESTION: Could it have been a mistake?

MR. MATTSON: That by itself may not have been the sole source of the difficulty. When we finally establish or when the utility finally established reactor coolant pump flow later in the day on Wednesday, then the transient came under control very rapidly.

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MR. FOUCHARD: Over here, the last one.

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QUESTION: If there's 30,000 rems inside the reactor, is that damaging or breaking down in any way the stainless steel shield?

MR. DENTON: I don't expect any impact on structural site members at all.

It will begin to have an effect on some of the cables I mentioned, the failure that had occurred.

QUESTION: Is that rems or rads, Harold?

MR. DENTON: It's a distinction I don't remember. It's certainly R per hour.

QUESTION: It's rad.

MR. FOUCHARD: All right. Thank you very much. Now, we will advise you as to whether we'll have any further briefings this afternoon if anything develops.

Now, obviously we can't conduct briefings under these conditions and have them effective. Now, we're going to try to get a PA system in here, but I think it is also important for those of you who want to be briefed to discipline yourselves.

Thank you.

(Whereupon, at 12:04 p.m., the press conference was concluded.)