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CORRESPONDENCE CONTROL TICKET

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AUTHOR:	Tom Gurdziel		
AFFILIATION:			
ADDRESSEE:	Gregory Jaczko		
SUBJECT:	Fukushima-related comments for 1/18/2012		
ACTION:	Appropriate		
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LETTER DATE:	01/18/2012		
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To: Leeds, NRR
Ref. G20120024
Due: 2/9/12
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DEDMRT
DEDR
DEDCM
AO
Regions
Bowman

Joosten, Sandy

From: Tom Gurdziel [tgurdziel@twcny.rr.com]
Sent: Wednesday, January 18, 2012 10:44 PM
To: CHAIRMAN Resource
Cc: hillsc@INPO.org; 'Tom Henry'; paul_eddy@dps.state.ny.us; 'Vanags, Uldis'; jicc@ws.mofa.go.jp; Screnci, Diane; 'Clary, Gregory'; Knutson, Ed; Gray, Mel
Subject: RE: Fukushima-related Comments for 1-18-2012

I sent this out too early by mistake. I found there were mistakes in wording in the third and fourth paragraph. These are corrected. The attached pictures are gone.

Sorry for the confusion,

Tom Gurdziel

From: Tom Gurdziel [mailto:tgurdziel@twcny.rr.com]
Sent: Wednesday, January 18, 2012 6:44 PM
To: 'chairman.resource@nrc.gov'
Cc: 'hillsc@INPO.org'; 'Tom Henry'; 'paul_eddy@dps.state.ny.us'; 'Vanags, Uldis'; 'jicc@ws.mofa.go.jp'; 'Screnci, Diane'; 'Clary, Gregory'
Subject: Fukushima-related Comments for 1-18-2012

Good morning,

Mark I Primary Containment Expected Performance

The Mark I Primary Containment is the one that has one part that looks like an upside down lightbulb (not yet built in the attached pictures),and, below it a little, a ring looking somewhat like an old tire tube. We call the upper part the drywell. The lower part is usually called the torus, but can be referred to as the suppression pool, (and very infrequently as the wetwell.) The lower part is partly filled with water during plant operation.

Suppose you have too much steam pressure in the reactor vessel. You can use relief valves to remove some. From the control room, remotely open a relief valve and the steam is directed through existing pipes to discharge under water in the torus. The water in the torus accepts energy from the steam and, at least for a period of time, condenses it.

Actually, you may not have to even do that. If the reactor pressure gets up somewhat beyond where it should be, the settings on the relief valves will open them without remote manual action and do the same thing.

There is one thing that needs to be done when dumping steam to the torus: you need to start some AC powered equipment and cool some heat exchangers (with some pumps) and provide (the now heated) torus water to these heat exchangers with some other, also AC powered, pumps. You have maybe 15 to 30 minutes to get this started.

If reactor vessel pressure continues to rise beyond what (our 6) relief valves can handle, then safety valves, (we had 16), start to open. The safety valves discharge directly to the drywell. As the pressure in the drywell rises, the inert (and non-condensable nitrogen) gas initially in the drywell, and the discharged steam flow into the torus water. So, pressure builds up in both the drywell and the torus, with the drywell mostly filled with (condensable) steam and the torus filled with most of the inert gas and perhaps some steam as well. (The torus above the water level was initially filled with nitrogen.)

If everything works as expected, the containment spray system is spraying torus water into both the drywell and the torus. The condensable steam in the drywell condenses and its pressure is reduced below that in the torus. At this point, the higher pressure in the torus causes flow through four piping connections (with check valves) from torus to drywell. The intent here is to avoid a vacuum in the drywell.

However, suppose an undesired vacuum would now occur in both the drywell and the torus. This is intended to be prevented by the opening of three reactor building to torus vacuum breakers. (These, too, are check valves).

Finally I am able to point out that a vacuum was reported for the Fukushima-Daiichi, Unit 3 containment on March 13, 2011. The reference is INPO Report 11-005, page 95, third line down from the top. Note that the two pressures given, 11.6 psia and 13 psia are BELOW atmospheric pressure, which is 14.7 psia or 0. psi or 0. psig (at sea level). If these pressures are not incorrectly reported, the Unit 3 reactor building to torus vacuum breakers, (at least), should be suspected of not working properly. For example, are they tested quarterly and are earlier test results available? Also, certain sequencing of the testing these valves may actually "precondition" the test results.

Thank you,

Tom Gurdziel

Joosten, Sandy

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Cc:	hillsc@INPO.org; 'Tom Henry'; paul_eddy@dps.state.ny.us; 'Vanags, Uldis'; jicc@ws.mofa.go.jp; Screnci, Diane; 'Clary, Gregory'
Subject:	Fukushima-related Comments for 1-18-2012
Attachments:	Aerial View.JPG; Drywell & Torus.JPG

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Actually, you may not have to even do that. If the reactor pressure gets up somewhat beyond where it should be, the settings on the relief valves will open without remote manual action and do the same thing.

There is one thing that needs to be done when dumping steam to the condenser: you need to start some AC powered equipment and cool some heat exchangers (with some pumps) and provide torus water to these heat exchangers with some other, also AC powered, pumps. You have maybe 15 to 30 minutes to get this started.