NRC Responses to Public Comments

Japan Lessons-Learned Project Directorate Interim Staff Guidance JLD-ISG-2012-02: Compliance with Order EA-12-050, Order Modifying Licenses with Regard to Reliable Hardened Containment Vents

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I. Introduction

This document presents the U. S. Nuclear Regulatory Commission's (NRC) responses to comments received on the Interim Staff Guidance: Compliance with Order EA-12-050, "Order Modifying Licenses with Regard to Reliable Hardened Containment Vents." The Interim Staff Guidance (ISG) was published June 7, 2012 (77 FR 33779). The public comment period closed on July 7, 2012.

Comment submissions on this proposed rule are available electronically at the NRC's Electronic Reading Room at http://www.nrc.gov/reading-rm/adams.html. From this page, the public can gain entry into ADAMS, which provides text and image files of NRC's public documents.

II. Description of Types of Comment Submissions

Treatment of Late-Filed Comments

The NRC determined that it was practical to consider comment submissions received on or before July 14, 2012. The NRC received two comment submission(s) after the July 7, 2012, end of the public comment period, but before July 14, 2012. This Comment Resolution Document provides the NRC's responses to these late-filed comment submissions.

Unique Comment Submissions

The NRC received five comment submissions including the late-filed submission. The NRC-designated identifier for each unique comment submission, the name of the submitter, the submitter's affiliation (if any), and the ADAMS accession number is provided in Comment Submission Table included in this document.

Comment Submitter Summary Table

Comment Submitted By	Comment Date	ADAMS Accession Number
1. Thomas Gurdziel tgurdziel@twcny.rr.com	06/07/2012	ML12177A378
2. Elizabeth Miller Vermont Public Service Department 112 State Street Montpelier, VT, 05620-2601	07/06/2012	ML12192A167

Comment Submitted By	Comment Date	ADAMS Accession Number
3. Frederick Schiffley Chairman, BWR Owners' Group 3901 Castle Hayne Road Mail Code A-70 Wilmington, 28402	07/06/2012	ML12192A165
4. Barbara Warren Executive Director Citizens' Environmental Coalition 33 Central Ave. Albany, NY 12210	07/08/2012	ML12192A166
5. Charles Bagnal on Behalf of Jerald G. Head Senior Vice President, Regulatory Affairs GE Hitachi Nuclear Energy PO Box 780 M/C A-18 Wilmington, NC 28402-0780	07/10/2012	ML12194A475

NRC Responses to Public Comments
Interim Staff Guidance: Compliance with Order EA-12-050
Order Modifying Licenses with Regard to Reliable Hardened Vents at BWR Facilities with Mark I and Mark II Containments

ISG Section 3.0 Requirement	Commenter	Comment	NRC Response
General Comment	Thomas Gurdziel 06/07/2012	I read Draft Rev 0 of JLD-ISG-2012-02, which is Interim Staff Guidance on compliance with Order EA-12-050 on BWR Mk I & Mk II containment venting. As I understand it, the order requires a vent system that can handle 1% reactor decay heat or less (in steam) with the primary containment at full design pressure. This system has apparently been around for a number of years, long enough, (I have read on a General Electric Internet page), that such hardened vent systems were actually installed in the Fukushima Daiichi plants operating on March 11, 2011. So, how did they work? Fukushima Daiichi Unit 1 had a hardened vent but its reactor core was not saved. Fukushima Daiichi Unit 3 had a hardened vent but its reactor core was not saved. Fukushima Daiichi Unit 2 had a hardened vent and it did not work. Its reactor core was not saved. It is my conclusion that the design bases of this proposed BWR Mk II plant addition are inadequate. Why install on BWR Mk II containments a system that has been demonstrated in accident conditions to not work on the BWR Mk I containments?	These comments pertain to Order EA-12-050, and are out-of-scope for JLD-ISG-2012-02.

ISG Section 3.0 Requirement	Commenter	Comment	NRC Response
General Comment	Elizabeth Miller Vermont Public Service Department 112 State Street Montpelier, VT, 05620-2601	The Department is aware that additional analysis continues to be done on the Fukushima Dai-ichi disaster. That continued analysis needs to be taken into account in the review and approval of the hardened containment venting system proposed by the licensees. The designs have to reflect the most current knowledge of what went wrong with the containment vents at Fukushima even if it causes refinements in proposed designs and additional expense to the licensees.	As the staff continues to evaluate Tier 1, Tier 2 and Tier 3 Fukushima-related activities, it will consider any and all information relating to the most current knowledge of the use of containment vents at Fukushima Dai-ichi.
General Comment	Barbara Warren Executive Director Citizens' Environmental Coalition	We are writing to convey our many concerns regarding the NRC response to this issue raised by the Near Term Task Force Report recommendation. We believe that the background technical and scientific work for this Order and interim staff guidance is terribly inadequate and carries the potential of increasing the danger of these Mark I & II Boiling Water Reactors. We believe a much more substantial background document is needed that comprehensively covers multiple interacting issues including adequate measures to address station blackouts, hydrogen control, the need for spark-free equipment, radiological releases, filters and the presence or absence of a more severe scenario involving core damage. There may be additional issues as well. The events at Fukushima and the Near Term Task Force Report were the basis of this order. This understanding should be fundamental to all actions related to hardened vents. Both the Order and the ISG repeat a story about what happened at Fukushima. We have pasted part of this story below from the Order and included our notations in Bold. Approximately 40 minutes following the earthquake and shutdown of the	The commenter addressed concerns relating to the adequacy of the March 12, 2012, Order such as the need for hydrogen control, filtration and the presence of core damage. These issues will be considered and addressed by the NRC staff in an upcoming Commission Paper that is currently planned for late 2012. In addition, the commenter raised concerns about the Mark I and Mark II plants that rely on containment accident pressure (CAP) to provide adequate net positive suction head (NPSH) to the emergency core cooling system (ECCS) pumps during the first few hours following a design basis loss of coolant accident (DBLOCA). (See page 10 for comment.) The staff position quoted by the commenter is not in agreement with the draft interim staff guidance officially issued for public comments. The commenter may be quoting this section from a previous version of this document during the stakeholder participation process. The ECCS pumps rely on assistance from CAP to provide adequate NPSH when these pumps operate at high flow rate during design basis

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		operating units, the first large tsunami wave inundated the site, followed by additional waves. The tsunami caused extensive damage to site facilities and resulted in a complete loss of all ac electrical power at Units I through 5, a condition known as station blackout (SBO). In addition, all direct current electrical power was lost early in the event on Units 1 and 2, and after some period of time at the other units. Unit 6 retained the function of one air-cooled EDG. Despite their actions, the operators lost the ability to cool the fuel in the Unit 1 reactor after several hours, in the Unit 2 reactor after about 70 hours, and in the Unit 3 reactor after about 36 hours, resulting in damage to the nuclear fuel shortly after the loss of cooling capabilities. **There is now evidence of core damage following the earthquake and before the tsunami.** Operators first considered using the facility's hardened vent to control pressure in the containment within an hour following the loss of all ac power at Unit 1. **Operators did not have adequate information about core damage, so they were in a severe accident scenario and didn't know it.** The Emergency Response Center began reviewing accident management procedures and checking containment venting procedures to determine how to open the containment vent valves without power. Ultimately, without adequate core	accidents such as a large break loss-of-coolant accident. The HCVS should not be open during such conditions. The purpose of the staff position under requirements 1.2.3 and 3.1 is to highlight the nexus between the CAP and adequate NPSH for the ECCS pumps and the precautions that should be included in the design and operational procedures to preclude inadvertent actuation of the HCVS. The HCVS is meant for beyond design basis external events with an extended station blackout. The turbine driven pumps that provide vessel injection under such conditions would not rely on CAP for NPSH since they would only function with intact reactor coolant system (RCS). The high flow rate, low head motor driven ECCS and containment heat removal pumps do not have power under SBO conditions. When AC power is restored, the required flow from these low pressure pumps is much less and, therefore, the required NPSH for these pumps would also be much less.

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		and containment cooling, primary containment (drywell) pressure and temperature in Units 1, 2, and 3 substantially exceeded the design values for the containments. When the operators attempted to vent the containments, they were significantly challenged in opening the hardened wetwell (suppression chamber) vents because of complications from the prolonged SBO, and high radiation fields that impeded access. **High radiation fields indicate that venting would have meant a significant radiological release.** At Fukushima Dai-ichi Units 1, 2, 3, and 4, venting the wetwell involved opening motor and air-operated valves. Similar features are used in many hardened vent systems that were installed in U.S. BWR Mark I containment plants following issuance of Generic Letter (GL) 89-16, "Installation of a Hardened Wetwell Vent." In the prolonged SBO situation that occurred at Fukushima, operator actions were not possible from the control room because of the loss of power, and the loss of pneumatic supply pressure to the air-operated valves. The resultant delay in venting the containment precluded early injection of coolant into the reactor vessel. The lack of coolant, in turn, resulted in extensive core damage, high radiation levels, hydrogen production and containment failure. The leakage of hydrogen gas into the reactor buildings resulted in explosions in the secondary	

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		containment buildings of Units 1, 3, and 4, and the ensuing damage to the facility contributed to the uncontrolled release of radioactive material to the environment. **The NRC is here advancing the idea that it was the delay in venting that prevented adequate cooling-not the early core damage, high heat and pressure, and SBO conditions.** A comprehensive technical document is clearly in order to discuss and explore many questions that arise here. Clearly the scenario in Fukushima was a severe accident scenario. Yet the Hardened Vent Order, supposedly from the Near Term Task Force report, which was written to address the safety implications of the Fukushima catastrophe is specifically excluding the use of these vents for severe accidents. Venting is to be used for prevention of core damage solely, according to the NRC. Previous accidents have shown us that there is a major problem assessing the extent of damage for months following an accident. This continues to be true at Fukushima. Given this problem, how does NRC propose to limit the use of vents to prevention only and not in situations where there is core damage and potential for significant radiological releases? This issue was not explored at all in the Interim Staff Guidance. Approximately four years from now all Mark I & II reactors will have installed modifications to meet the new order-but they will not include	

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		spark-free valves and equipment, hydrogen control measures, or filters. The problem of station blackouts is the main driver of the entire scenario put forward by the NRC supporting this questionable Order and the ISG, yet station blackouts have not yet been addressed. Rulemaking for SBOs may take several years. An interim order addressing station blackouts the backup equipment and the total number of hours of service would be the most sensible way to proceed and would address a significant contributor to loss of cooling capability. Wind and solar power backups should be seriously considered to address SBOs, as well as water based generators in flowing rivers, in conjunction with adequate battery storage. Hydrogen is only addressed in relation to avoiding cross connections for venting. No hydrogen controls are proposed and no measures in the constructions of the vents to prevent sparking sources from causing an explosion. The issue of radiological releases has not been thoroughly considered. In the absence of full information for the reactor operator about the status of the core and adequacy of cooling we believe the use of venting could involve large scale radiological releases and harm to the public. We believe given the evidence provided related to this proceeding that the NRC is not addressing Fukushima or the Near Term Task Force Report but instead providing life support for a major problem	

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		associated with the nuclear reactors of the earliest designs. The containment for Mark Is is known to be too small to contain a severe accident. High pressures will occur with this containment and these reactors represent the majority of the oldest reactors in the nation. How embrittled are these Mark I containments? How many have cracks? It seems likely that reactor owners would be seeking all sorts of options to enable them to stay in business. This particular Flex option is not acceptable. We also believe it could facilitate regular radiological releases that could impact public health. The NRC also raises a significant issue regarding the issue of loss of coolant accidents. According to the NRC there are three ways that the hardened vent could be activated inadvertently - compromising emergency core cooling. "However, an inadvertent actuation of HCVS due to a design error, equipment malfunction, or operator error during a design basis loss-of-coolant accident (DBLOCA) could potentially have an opposite effect. The emergency core cooling system (ECCS) pumps start on a DBLOCA and operate at a high flow rate, providing core injection. A number of Mark I and Mark 1I plants rely on containment accident pressure (CAP) to provide adequate NPSH to the ECCS pumps during the first few hours after a DBLOCA. The HCVS has no function during a DBLOCA. The vent should not	

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		be open during a DBLOCA; however, if it were to be open, the CAP would be compromised thus leading to a potential failure of the ECCS pumps due to inadequate NPSH. Therefore, prevention of inadvertent actuation is an important issue for all plants but extremely more important for plants relying on CAP." We believe the issue of hardened vents is a highly technical issue that needs more serious consideration. We were shocked to hear NRC staff describe the use of the vents for prevention of core damage and to understand that the Order and the ISG have nothing to do with Fukushima or severe accidents. We were promised renewed attention to safety following Fukushima. While we recognize the importance of hardened vents, this proposal is not comprehensive in dealing with all the relevant issues, is not scientifically supportable and is therefore unacceptable.	
	Charles Bagnal on Behalf of Jerald G. Head Senior Vice President, Regulatory Affairs GE Hitachi Nuclear Energy	General Comment/Question – In the introduction, it is stated that, "The hardened vent system shall be capable of reliable operation under a range of plant conditions, including a prolonged SBO and inadequate containment cooling." These are clearly beyond design basis situations. The introduction section goes on to say, "If core cooling were to fail, closure of the vent valves may be necessary under severe accident conditions." This implies that an HCVS is expected to be operable in a severe accident. Although much of the wording of the Order and the Draft ISG are tailored to the system's function of protecting the core, please clarify the conditions to be considered in the design of the HCVS.	In order to clarify the staff's intent and provide consistency, the second last sentence in the ISG paragraph was revised to read: "If core cooling were to fail, closure of the vent valves may be necessary prior to the onset of core damage because the HCVS may not necessarily be capable of operating under severe accident conditions."

ISG Section 3.0 Requirement	Commenter	Comment	NRC Response
1.1.1	Frederick Schiffley Chairman, BWR Owners' Group	Q1: What is the rationale behind the 24 hour requirement? This does not appear to be consistent with the emergency response time per the order for NTTF recommendation 9.3. C1: Change "started" to "operated" in first line of 2nd paragraph. Q2: Are the following acceptable examples of readily accessible locations? Remote shutdown panel An area in the reactor or turbine building normally visited by operators on rounds not involving a contaminated, a high rad or area only accessible by a ladder. In addition, this area should be above the design basis external flood elevation or protected from the design basis external flood?	A1: Requirement 1.1.1 states that the HCVS shall be designed to minimize the reliance on operator actions. The first 24 hours following an accident are extremely critical, and operator actions should be focused on restoring core cooling rather than on maintaining containment integrity. Therefore, in order to ensure that operators are able to maintain their focus on efforts to restore core cooling, the HCVS should be capable of reliable operation during the first 24 hours without the need for unnecessary operator actions, such as restoring electrical power to system components or installing an alternate means to provide motive force to system isolation valves, during this time. R1: The word "started" was changed to "operated" in the first line of the second paragraph in order to clarify the staff's intent. A2: Remote locations for HCVS operations are acceptable if they are readily accessible to plant operators, and comply with the flooding and "seismically rugged design" criteria under Requirements 1.2.2 and 2.2.
1.1.2	Frederick Schiffley Chairman, BWR Owners' Group	Q: Should the word "applicable' be inserted in front of "Design basis accidents" since conditions following loss of coolant breaks or main steam line breaks, for example, don't seem applicable?	This section was clarified by deleting references to design basis accidents and, instead, uses the term "beyond design basis external events" in order to provide consistency in describing potential plant conditions that licensees should consider.

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	Charles Bagnal on Behalf of Jerald G. Head Senior Vice President, Regulatory Affairs GE Hitachi Nuclear Energy	Question – First paragraph states that, "Licensees should take into consideration plant conditions expected to be experienced during design basis accidents when locating valves, instrument air supplies…" Second paragraph states that plant unique knowledge of how extended SBOs would affect temperature (and lightning). Then later in Section 1.2.1 Staff Position begins with, "Beyond design basis external events…" Should not beyond design basis events (worst case for a particular parameter; temperature, lightning, etc.) be more appropriate for this section to refer to in the occupational hazards considered?	This section was clarified by deleting references to design basis accidents and, instead, uses the term "beyond design basis external events" in order to provide consistency in describing potential plant conditions that licensees should consider.
1.1.3	Frederick Schiffley Chairman, BWR Owners' Group	C: In the sentence "If venting from locations other than wetwell is desired, licensees must provide sufficient justification for their request. If only venting from locations other than the wetwell, delete "is desired".	The staff guidance for Requirement 1.1.3 was revised to remove references to "desired" venting locations.
1.2.1	Frederick Schiffley, Chairman BWR Owners' Group	Q: The order and the ISG refer to different containment pressures, design and PCPL. Which is correct?	The staff position for Requirement 1.2.1 was clarified to ensure that containment pressure was kept below the lesser of the PCPL and containment design pressure.

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	Charles Bagnal on Behalf of Jerald G. Head Senior Vice President, Regulatory Affairs GE Hitachi Nuclear Energy	Comment - Section 1.2.1 states that, "The HCVS shall have the capacity to vent the steam/energy equivalent of 1 percent of licensed/rated thermal power, and be able to maintain containment pressure below the primary containment design pressure." It is understood that this is taken directly from the Order (12-050). This is in conflict with the follow-up "Staff Position" statement which is written, "…a vent sized under conditions of constant heat input at a rate equal to 1 percent of rated thermal power and containment pressure equal to the primary containment pressure limit is sufficient to prevent the containment pressure from increasing any further." The concern, in this case, is that several Mark I BWRs have indicated that their PCPL values are below their containment design pressures. In a case such as that, if venting at 1% RTP begins at PCPL (and the system is designed to control below containment design pressure), containment pressure would actually rise above PCPL before beginning to drop off due to the venting. Such a scenario would bring into question the ability of the plant to make use of needed systems to maintain the vessel in a stable condition and properly mitigate conditions brought on by the accident. –-	The staff position for Requirement 1.2.1 was clarified to ensure that containment pressure was kept below the lesser of the PCPL and containment design pressure.

ISG Section 3.0 Requirement	Commenter	Comment	NRC Response
1.2.2	Frederick Schiffley Chairman, BWR Owners' Group	Q1: Is 5 cycles of opening/closing the room are also acceptable, provided the main isolation valves per 24 hours an acceptable number of cycles without detailed plant-specific analysis? Q2: Would it be acceptable to use a Pressure control device downstream of containment isolation valves (CIV) to allow the option of continuous venting to maintain a specific containment pressure? C1: The "maximum flood" applicable to prolonged SBO, manual operation/action may also become necessary to operate the design of the HCVS is the design basis external flood. C2: "Reasonable protection" should be defined by reference to the NRC Order EA-12-049 ISG, rather than by separate definition in the NRC Order EA-12-050 ISG. Q3: Is the direct access operation of valves required in addition to the remote operation? Could a redundant DC circuit and air supply substitute for the direct access operation?	A1: Requirement 1.2.2 was clarified to state that licensees "shall determine the number of open/close cycles necessary during the first 24 hours of operation and provide supporting basis consistent with the plant-specific containment venting strategy." A2: The staff would consider the use of pressure control devices to maintain a specific pressure provided the installed capacity of supporting systems (e.g., pneumatic and electrical power) is sufficient to support operation during the first 24 hours. R1: Requirement 1.2.2, Item 3, was clarified by referencing the design basis external flood and removing redundant language. R2: Requirement 1.2.2, Item 4, was clarified to ensure that equipment was protected in accordance with the staff's guidance delineated in JLD-ISG-2012-01 for Order EA-12-049 A3: Direct access is not a requirement if other means to open/close the valves are provided. A redundant DC circuit and air supply could substitute for direct access operation.
	Charles Bagnal on Behalf of Jerald G. Head Senior Vice President, Regulatory Affairs GE Hitachi Nuclear Energy	Comment – Please clarify a uniform basis for determining the number of valve operating cycles to be designed for, alternately consider providing a lower limit of valve operating cycles.	Requirement 1.2.2 was clarified to state that licensees "shall determine the number of open/close cycles necessary during the first 24 hours of operation and provide supporting basis consistent with the plant-specific containment venting strategy."

ISG Section 3.0 Requirement	Commenter	Comment	NRC Response
1.2.3	Frederick Schiffley Chairman, BWR Owners' Group	Q: Is it the NRC's intention to exclude the use of rupture disks as a means to prevent inadvertent actuation of the HCVS?	A: By not including the phrase "rupture discs" in examples of design features that may be used to prevent inadvertent actuation of the HCVS, the staff did not intend to discourage the use of rupture discs. In order to clarify the staff's intention, the term "rupture discs" was added to the list of example design features in Requirement 1.2.3.
	Charles Bagnal on Behalf of Jerald G. Head Senior Vice President, Regulatory Affairs GE Hitachi Nuclear Energy	Question – Rupture discs have been a long accepted solution for the prevention of inadvertent actuation of a hardened vent. Does the conspicuous lack of direct references to rupture disks, such as those installed under GL 89-16, mean that the NRC Staff discourages the use of these features? The use of a completely passive system utilizing rupture discs is still considered as a reasonable method of assuring containment remains intact with no active operator intervention. Please state the Staff's position on the inclusion/exclusion of the use of a rupture disc in the HCVS.	A: By not including the phrase "rupture discs" in examples of design features that may be used to prevent inadvertent actuation of the HCVS, the staff did not intend to discourage the use of rupture discs. In order to clarify the staff's intention, the term "rupture discs" was added to the list of example design features in Requirement 1.2.3.
1.2.4	Elizabeth Miller Vermont Public Service Department 112 State Street Montpelier, VT, 05620-2601	This requirement pertains to the importance of monitoring the status of the HVCS at all times; although the "e.g." mentions only valve position, the Department urges NRC to clarify that such monitoring should include all relevant information related thereto, such as system pressure and effluent temperature. The Department also notes that transducers that measure these parameters may experience very harsh environments that can affect their performance. Therefore, we believe this requirement should state expressly that the design and installation of these transducers must meet 10 CFR 50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants".	Requirement 1.2.4 was rewritten to provide clarification on instrumentation requirements, including the need to consider potentially harsh environments that may be experienced in the design of the system. As HCVS equipment is required for beyond design basis external event, as opposed to a design basis accident, the environmental requirements for safety related equipment, such as 10 CFR 50.49 do not apply in this case.

ISG Section 3.0 Requirement	Commenter	Comment	NRC Response
	Frederick Schiffley Chairman, BWR Owners' Group	C: There are many ways to monitor the status of the HCVS system. Is the guidance providing examples or requiring the options of valve position, system pressure and effluent temperature? Other parameters, for example a rad monitor (which some plants have already installed) could provide equivalent monitoring to some of the parameters listed.	Requirement 1.2.4 was rewritten to provide clarification on instrumentation requirements. The staff may allow alternative approaches to provide equivalent system status information to operators, if adequately justified by licensees.
1.2.5	Elizabeth Miller Vermont Public Service Department 112 State Street Montpelier, VT, 05620-2601	In this requirement, it is not clear whether NRC believes that radiation monitoring could be fulfilled by the stack monitors if such monitors were in the vent path. The Department does not believe that would be adequate. We believe there is value to monitoring the effluent just after the valve(s), at a point that will provide affirmation that the effluent is flowing and a measurement of the gross activity at this point. Should a break in the vent path occur before the stack monitors, information on the activity and flow of effluent would not be readily available. In addition, we urge that NRC clearly state the requirements for the testing and frequency of calibration of any radiation monitor. Finally, we ask that NRC evaluate whether there is benefit to having backup monitoring unit(s) installed.	Requirement 1.2.5 was revised to clarify the staff's position that a radiation monitor, independent of the existing vent stack radiation monitors, shall be provided to monitor the gross activity associated with the potential release of radiation via the HCVS. Testing and calibration frequency requirements for radiation monitoring components were added to Requirement 1.2.7
	Frederick Schiffley Chairman, BWR Owners' Group	Q1: Is an acceptable rad monitor range 0.1 to 1,000mr/hr? Q2: Is periodic monitoring of a rod monitor recorder an acceptable monitoring method? Q3: Is it acceptable for the remote indicating location to be in the remote shutdown panel or is it the expectation of the NRC that it be near the manual connections? Please explain the purpose of the staff intent.	A1: The purpose of the HCVS radiation monitoring subsystem is to allow plant operators to be able to discern the presence of, or the onset of, core damage during HCVS operations, and to be able to take appropriate action to cease venting operations. A radiation monitor range of 0.1 to 1,000 mrem/hour is acceptable for this purpose. A2: The staff finds that the use of a radation monitor recorder is acceptable provided that it is readily accessible for periodic monitoring, and that

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		Q4: Can supplemental portable power sources be used to power rad monitoring during the first 24 hours?	it meets the requirements for sustained operations during the first 24 hours of operation. A3: The radiation monitor indication should be co-located where HCVS operations are performed and monitored (i.e., control room, remote HCVS panel, etc.) A4: As stated in Requirement 1.1.1 of the ISG, durations of less than 24 hours will be considered if justified by adequate supporting information from the licensee. The basis for acceptance is provided in the revised staff position under Requirement 1.1.1 of the ISG.
1.2.6	Frederick Schiffley Chairman, BWR Owners' Group	Q1: Since automatic closure of interconnected systems upon initiation of the hardened vent flow path could add significant complexity to the design, is remote manual operation/verification from the control room or remote location acceptable (especially if these valves are designed as fail-shut on a loss of control circuit power or air)? C1: Add "Examples of" in front of "acceptable means" C2: Leak tightness is addressed in 1.1.3 and 1.2.6 and should only be included under 1.2.7.	A1: The use of remote manual valve operation with verification from the control room or remote location (HCVS control panel) is an acceptable approach to isolate interconnected systems from the HCVS, provided that operators are able to affirmatively verify the actual position of the valves. R1: Sentence was revised to read: "Examples of acceptable means for prevention of cross flow is by valves, leak-tight dampers, and check valves, which shall be designed to automatically close upon the initiation of the HCVS and shall remain closed for as long as the HCVS is in operation." R2: Guidance relating to leak tightness testing was moved to Requirement 1.2.7

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	Charles Bagnal on Behalf of Jerald G. Head Senior Vice President, Regulatory Affairs GE Hitachi Nuclear Energy	Comment – Initial documentation from the NTTF indicated that multi-unit sites with a common stack (which acts as the release point for more than one unit) must be able to vent all units simultaneously. Is this still the case, or are the units allowed to vent at different times so long as each unit meets the requirements of Requirement 1.2.1 when it is venting? - Also, it is stated that, "Licensees shall provide design features to eliminate or minimize the unintended cross flow from the HCVS to other areas within the plant…" It is assumed that this is intended to address the typical tie-in to the SGTS (as is the case with some such systems). Relative to the final statement (containing the stipulation "periodically verified by testing"), please provide basis and acceptance criteria for such testing which justifies the acceptability of cross ties with associated low pressure systems.	Requirement 1.2.1 was revised to state that "vent sizing for multi-unit sites must take into consideration simultaneous venting from all the units." Requirement 1.2.6 was changed to provide a reference to Requirement 1.2.7 for valve testing requirements. Requirement 1.2.7, now states that HCVS testing will include a leak rate test: (1) Prior to first declaring the system functional; (2) Once every 5 years thereafter; and (3) After restoration of any breach of system boundary within the buildings. Permissible valve leakage rates will be governed by the ASME OM Code.
1.2.7	Frederick Schiffley Chairman, BWR Owners' Group	Q1: If using a rupture disk, is replacing the rupture disk according to the manufacturer's recommendation, not to exceed every ten years, acceptable? C1: It may not be possible to totally eliminate condensate accumulation, HCVS design must be able to accommodate condensation (including potential water hammer loads, if applicable). C2: Add "control logic" after 2nd HCVS	A1: By their nature, rupture discs are passive devices, and the NRC staff finds that replacing rupture discs in accordance with manufacturer recommendations, not to exceed every ten years, is acceptable. R1: Requirement 1.2.7, paragraph 1, was clarified on the subject of condensate accumulation and potential water hammer loads. R2: The staff clarified Requirement 1.2.7 by adding a table showing testing and inspection requirements and their associated frequencies, HCVS procedure validation was further clarified by including the phrase "control logic" in the description.

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1.2.8	Frederick Schiffley Chairman, BWR Owners' Group	Q1: What is the basis for 100 psig? Because our procedures operate the vent prior to reaching high pressures, is it acceptable to design the system to the higher of the containment design pressure or PCPL? Q2: If the answer to the above question is "no", then is the 100 psig confined to piping or do the valves need to be designed to operate with a 100 psi differential pressure?	A1: 1.2.8 was changed to read: "shall be designed for the higher of the containment design pressure or PCPL, and a corresponding saturation temperature. " A2: see above.
1.2.9	Frederick Schiffley Chairman, BWR Owners' Group	Q: One of the higher locations of the reactor building is typically the exhaust plenum. Is running the vent piping up the side of the exhaust plenum acceptable?	Licensees that choose to run the vent piping up the side of the exhaust plenum, must be able to demonstrate that no cross flow occurs back into the plant.
2.1	Frederick Schiffley Chairman, BWR Owners' Group	C: Delete "including General Design Criteria (GDC)-54 "Piping systems Penetrating containment" and GDC-56 "Primary containment isolation."' from the first sentence. Delete the second sentence, "The piping and piping supports shall be designed to meet Seismic Category I requirements."	Because many plants do not include General Design Criteria as part of its design basis, references to the GDCs and Seismic Category I requirements were removed. Licensees are to design the system consistent with the licensing basis for the plant.

ISG Section 3.0 Requirement	Commenter	Comment	NRC Response
	Charles Bagnal on Behalf of Jerald G. Head Senior Vice President, Regulatory Affairs GE Hitachi Nuclear Energy	Comment – There are existing NRC approved containment overpressure protection systems (Ref NUREG-1503) and GL-89-16 systems that do not comply with the Staff guidance of; "The NRC staff prefers HCVS designs with a dedicated penetration and dedicated vent valves that would be kept closed at all conditions except for periodic testing and when the HCVS is called into operation with a short run of piping leading to the vent release point." Since the goal of the Order and guidance is prevention of core damage and containment protection, narrowing the configurations to that outlined in the sentence could be limiting. Consider deleting this specific sentence or modifying it so that other configurations that meet the order and remaining guidance in this section can be presented.	The staff position for Requirement 2.1 was revised to delete any references to preferred venting configurations.
2.2	Frederick Schiffley Chairman, BWR Owners' Group	C: Delete "requirements of the applicable American Society of Mechanical Engineers Boiler and Pressure Vessel Code and" and "the American Institute of Steel Construction."	Requirement 2.2 was changed to read: "hardened vent shall be designed to conform to the requirements consistent with the applicable design codes for the plant…""
3.1	Frederick Schiffley Chairman, BWR Owners' Group	Q: What was the NRC's expectation for licensee action after 7 days?	Based on further staff review, the allowed unavailability time was changed from 7 days to 30 days. In addition, Requirement 3.1 was clarified to state that, if the allowed unavailability time exceeds 30 days, "the TRM shall direct licensees to perform a cause assessment and take the necessary actions to restore HCVS availability in a timely manner…"