

Mark I and Mark II BWRs Containment Venting Systems

Guidance for Order EA-13-109

March 5, 2014



Agenda

- Introductions
- Opening remarks
- Schedules
- NRC presentation
- Industry presentation
- Public questions and comments
- Toll free number: **888-390-5220** and pass code: **95881**



Schedule

- ISG endorsing NEI 13-02 – November 15, 2013
- Public meetings – Dec. 5, 2013, Jan. 15, Jan. 29, and February 19, 2014
- Next public meeting – March 26, 2014
- Overall Integrated plan (OIP) – June 30, 2014



Review Process

- OIP submittals – June 30, 2014
- Pilot Plants OIP submittals-March/April 2014
- NRC staff feedback – April/May 2014
- NRC staff review and interim staff evaluations (ISEs) – December, 2014



NRC Presentation



Japan Lessons Learned

Staff Comments - FAQs

- **HCVS-01, Primary and Alternate Controls and Monitoring Locations**
- **Main Control Room (MCR)**
- The design of MCR to conform to GDC 19/Alternate Source term is for a specific set of evaluated accidents such as LOCA with mitigation systems such as the MCR filtration systems functioning. Under ELAP conditions, the benefit of the filtration systems is lost for at least 24 hours in Order EA-13-109 space. The staff agrees that the MCR is relatively a safer location, but stating that it will conform to GDC 19 under the severe accident scenario is not correct. Since Order EA-13-109 deals with severe accident, the implementation of the order has to specifically recognize that conditions in MCR may not meet GDC 19 requirements and address the measures that are available and can be taken to continue to operate the HCVS if the ELAP deteriorates to a core melt (e.g. stay times, protective clothing, respiratory protection).



Staff Comments - FAQs

- **HCVS-01, Primary and Alternate Controls and Monitoring Locations**

- **Thermal Considerations**

- The evaluation of temperature and heat loads due to the proximity of undercooled containment should include the consideration of severe accident conditions in the containment and SFP heat-up.

- **2nd paragraph under Time Frame**

The OIPs should clearly identify the minimal operator actions that are being relied on to assure operating capability of HCVS equipment. If the actions are coming from some other guidance such as for FLEX, provide a cross reference to where the information can be found and how it is adopted for severe accident conditions.

Include a statement to the effect that “the intent is that FLEX portable equipment not be credited in making HCVS controls accessible.”



Staff Comments - FAQs

- **HCVS-03, Alternate Control Operating Mechanisms**
- Suggest rewording the words on “direct operation capability”. One way to state is “the inclusion of direct operation capability (e.g. reach-rod with hand wheel) is one method of enhancement, however, other methods as stated above are acceptable.
- **HCVS-04, HCVS Release Point**
- **Release Velocity**
- Given that HCVS can be used for anticipatory venting and in filtration strategies, 800 fpm release velocity may not always be there during venting. Suggest looking into more recent ASHRAE publications such as 2003 ASHRAE HVAC Applications (Chapter 44) and 2011 ASHRAE HVAC Applications (Chapter 25) to justify lower release velocity.
- FAQ should state that the vent will not be used during normal operations and that it is meant for ELAP conditions induced by beyond design basis events??



Staff Comments - FAQs

- **HCVS-05, HCVS Control and Boundary Valves**

- **Description**

In the second paragraph, it is not clear what is meant by “CIVs connected to Containment Atmosphere not associated with HCV”. For instance, all CIVs in the enclosed sketch have an association with HCVS. Clarify in the FAQ, which CIVs meet the intent of this statement.

- **Valve Definitions**

It appears like there are five categories of valves, CIVs, CIV and Control Valve, CIV and Boundary valve, Control Valve, and Boundary Valve, which can be divided into three definitions, CIV, Control Valve and Boundary Valve. Staff recommends that the HCVS schematics in each plant’s OIP template include the demarcation of the valves into the separate categories as depicted in the example sketch in the FAQ. Staff also recommends that all interconnections with the vent path, including connections to plant or vent stack be shown (e.g. ventilation, off-gas) clearly denoting if the connections have boundary valves or not. The sketch should clearly show the valves as open, closed, cycled (throttled), and indicate the containment barrier.



Staff Comments - FAQs

- HCVS-05, HCVS Control and Boundary Valves

Testing Criteria and Valve requirements and Valve Type-

- The OIPs should include details of the current design of the boundary valves (in terms of isolation on initiation of the HCVS), and the modifications that will be performed to achieve the desired operation as a result of Order EA-13-109.



Staff Comments - FAQs

- HCVS-01 – Under the response support Order Element 1.1.4, the HCVS controls and displays (instrumentation) need to be included in the habitability answer.
- HCVS-03 – Shouldn't "alternate manual operation" include not only the "final control element" as per ISA terminology but also support indications for the operator decision, since the operation of the HCVS is dependent on a working primary variable measurement?



OIP Template - Hatch

- Hatch June 2014 Draft Template:
- Hatch, page 4 of 42 – Will the portal provide the results of the calculation depicting the battery backup duty cycle requirements and demonstrating the capacity with the HCVS control instrumentation?
- Hatch, page 5 of 42 – Under the generic assumption 109-5, the statement appears to be segregating the existing containment instrumentation and controls from having to follow the Order EA-13-109. If this is true, then how will the performance of this existing instrumentation be evaluated under the severe accident conditions such as temperature, pressure, high humidity and radiation (ES-13-109 Order). Will there be any kind of analysis done? Will there be results for the analyses used to verify the design criteria and methodology for same seismic testing used for the new HCVS instrumentation? What about mounting and power considerations with the intrinsically safe or explosion proof?



OIP Template - Hatch

- Hatch, page 5 of 42 – Ask for clearly labeled sketch or marked up plant drawings of the plan view for electrical wiring, intrinsically safe units, control diagrams, routing of cables from existing and new transmitters, sensors, towards the control and remote panels and finally the solenoid valves with HCVS piping locations, sensing and indication locations and auditing information.
- Hatch, page 7 of 42 – Table 2-1 to be expanded to include the secondary mechanically manual operated final elements and add the primary element variable measurement instrumentation with options and possible alternatives for the operator.



OIP Template - Hatch

- Hatch, page 10 of 42 – Because a portion of the vent piping is underground, provide sketches showing the HVCs systems controls and their location?
- Hatch, page 11 of 42 – Will there be more details on this page for the last 3 bullets? Can the qualification criteria be stated for the safety related equipment as it is different from the HCVS equipment? What are the relative distinctions between the two types of equipment and the system interaction for the HCVS function?
- Hatch, page 13 of 42 – To allow for a performance of a minimum of 13 cycles under “Power and Pneumatic Supply Sources, #1,” will there be a specific method or combination of methods used to confirm the reliability of a full system action which includes the operator and decisions made from the primary variable measurements for cycling the HCVS vents?



OIP Template - Hatch

- Hatch, page 15 of 42 – Under “Component Qualifications” the sentence s that “HCVS components that directly interface with the pressure boundar be considered safety related, as the existing system is safety related. Likew any electrical or controls component which interfaces with Class 1E interf power sources will be considered safety related...” If this is true, then the connected components must be qualified for the same requirements in cl 1E and the criteria of the HCVS order. (same as #2)
- Hatch, page 16 or 42 – What are the control instrumentation qualification performance and accuracy? Will the accuracy and environmental range of existing wetwell and containment pressure be analyzed and verified to function for a severe accident condition and provide the needed reliability the HCVS cycling?



Industry Presentation



Japan Lessons Learned

Questions & Discussion



Japan Lessons Learned