

## Control Rod Drive Mechanism (CRDM) Seismic Restraint Reduction/Elimination

### Background

The CRDM seismic support assembly is typically equipped with four radial seismic restraints that resist lateral translation of the CRDM seismic support platform, and two tangential seismic restraint assemblies that resist CRDM seismic support platform rotation. Both the radial and tangential seismic restraints are typically designed to take tension loadings only.

Reactor vessel closure head (RVCH) disassembly and reassembly activities are major considerations when it comes to a refueling outage's critical path schedule, personnel radiation exposure, critical containment resources, personnel safety and cost.

One solution to optimize the RVCH disassembly and reassembly process is to reduce the number of CRDM seismic restraint connections (or possibly eliminate all connections) between the CRDM seismic support platform and reactor cavity wall.

### Description

As the originator of the Design Specification and Analysis of Record (AOR) for these CRDM seismic support systems, Westinghouse is uniquely positioned to be able to quickly determine the feasibility of reducing/eliminating the seismic supports for each plant.

Reduction is possible for all plants; the tension-only CRDM seismic restraints would be replaced by new seismic restraints designed to take tension **and** compression loadings. These new CRDM seismic restraints can also be removed and installed without the use of a man basket. The CRDM seismic restraint would include a retractable pin and clevis assembly, allowing the clevis pins to be inserted or removed from the CRDM seismic support platform lugs and cavity wall lugs using a long handled tool. Permanent rigging is also provided with the new seismic restraints.

Elimination is possible for plants whose RVCH lift legs are safety-related (SR) components. Plants that would like to eliminate all seismic restraints but do not have ASME SR lift legs could replace their current lift legs with ASME SR lift legs. This scope can be provided as part of a CRDM seismic support elimination project.



*CRDM Seismic Support*

### Benefits

These modifications help to:

- Reduce critical path outage duration
- Reduce personnel dose
- Decrease risks to personnel safety (eliminate use of man basket)
- Reduce demand on critical outage resources (polar crane, labor and containment laydown space)

### Deliverables

Westinghouse works closely with our customers to determine the level of support needed.

#### Engineering Deliverables

- Design specification
- New CRDM seismic restraint drawings
- Updated CRDM seismic support assembly drawing (will include new and/or eliminated seismic restraints)
- Additional design drawings dependent on project scope
- CRDM seismic restraint structural analysis
- Updated design report
- New hardware

#### Additional Services

- Installation procedure
- Installation services
- Licensing assistance
- Plant document change package (DCP)

