

CCW Heat Exchanger Fouling Examples

During a review of the DBA heat removal calculation a non-conservative assumption for fouling factor (FF) is found for the Component Cooling Water Heat Exchangers.

The following examples are given different initial conditions to address varying reporting thresholds.

CCW

HX Example 1

- Condition: Assumed FF does not support Operability during summer months.
- Corrective Action: Restrict Operation above a specified ultimate heat sink temperature until modifications can be made, and establish FF monitoring Program.
- Reportable under existing criteria because of the loss of safety function and multiple trains[50.73 (a) (2) (v) & (vii)] and the new criterion as well.

CCW

HX Example 2

- Condition: Assumed FF does support Operability during summer months, but margin is reduced.
- Corrective Action: Establish FF monitoring Program, and clean HX's as necessary.
- Not Reportable under existing criteria. No impact on safety function or operability.
- Reportable under the new criterion as modified because of the establishment of the monitoring program.

CCW

HX Example 3

- Condition: Assumed FF does support Operability during summer months, but margin is reduced. FF monitoring Program has already been established. HX “A” found to have high FF & Inoperable. “B” HX is Operable, but has high FF.
- Corrective Action: Clean both HX’s
- Not Reportable under existing criteria. No loss of safety function, only one train Inoperable.
- Reportable under the new criterion as modified because both HX’s are cleaned.

CCW

HX Example 4

- Condition: Assumed FF does support Operability during summer months, but margin is reduced. FF monitoring Program has already been established. HX “A” found to have high FF & Operable. “B” HX is also Operable, but has increasing FF.
- Corrective Action: Clean both HX’s
- Not Reportable under existing criteria. No loss of safety function, no train Inoperable.
- Reportable under the new criterion as modified because both HX’s are cleaned.

CCW

HX Example 5

- Condition: Assumed FF does support Operability during summer months, but margin is reduced. FF monitoring Program has already been established. HX “A” found to have acceptable FF & Operable, but is trending up.
- Corrective Action: Increase frequency of monitoring from weekly to daily for both HX’s
- Not Reportable under existing criteria.
- Reportable under the new criterion as modified because both HX’s have monitoring changes.

Diesel Wall Example

- Condition: Non Load-Bearing Firewalls, subject to seismic forces, support safety-related components associated with Emergency Diesel Generators. Although walls are operable per engineering judgment, the safety factor of walls is not up to the desirable design standards due to addition of components supported by the walls.
- Corrective Actions: Modifications (bracing) of all walls for 3 trains in both units are being implemented to increase safety factors.
- Not Reportable under existing criteria. No impact on safety function or operability.
- New criterion would require reporting corrective actions to ensure ability of more than one train....

BWR Control Rod Drive Maintenance

- **Conditions:** Thermocouples measure temperature to indicate bypass flow (increased temperature indicates seal degradation). Rods are tested during cycle and are operable.
- **Corrective Action:** High temperature CRDs are candidates for changeout during next outage
- **Not Reportable** under existing criteria. No impact on safety function or operability.
- This is regular preventive maintenance activity but meets new reportability criterion

Containment Isolation Valves

- Condition: Steam leak during operation impinges on 2 CIVs (different systems and different trains). Stem lubricant is degraded on both valves. Valves are tested and still operable, but margin is reduced below GL 89-10 program goals.
- Corrective Action: Both stems are lubricated after steam leak was repaired (during refueling outage).
- Not Reportable under existing criteria - No impact on safety function or operability.
- Reportable under new criterion due to corrective action on multiple systems.

Operating Experience

- Condition: RHR throttle valves are rebuilt frequently, every outage.
- Corrective Action: OE results in procedure changes for operating throttling valves for 2 trains of RHR in test mode to reduce rate of component degradation.
- Not Reportable under existing criteria. No impact on safety function or operability.
- Corrective action applied to both trains of RHR and therefore, would be reportable per the new criterion

Conclusions

- These examples provide conditions that are clearly not reportable under existing criteria, but would be reportable under the new proposed criterion.
- Any new criterion wording should be modified to preclude unnecessary reporting of routine activities such as those provided by these examples.

Criterion:

Any event or condition that ...

Required corrective action for a single cause or condition in order to ~~ensure~~ *restore* the ability of more than one train or channel to perform its specified safety function.

Proposed Criterion 10 CFR 50.73(a)(2)(ii)(C)

Introduction

- Overview
- Basis for new criterion
- Clarity of new criterion
- Impact of new criterion

Recognize attempt to compromise and
clarify new criterion based on comments

Overview

- Does the criterion intend reporting conditions where components are still operable?
- As currently proposed, without further modification, new criterion is a show-stopper
- Newly proposed criterion still lacks clarity and introduces many additional reports
- Context of being under 50.73(a)(2)(ii) can be misleading to stakeholders regarding safety significance of reported items.
 - A. principal safety barriers seriously degraded
 - B. unanalyzed condition that significantly affects plant safety

Basis of New Criterion

- Industry is confused. (Data gathering?)
- Below threshold of expected reporting
 - Lacks clear tie to risk significance
 - Below operability threshold
- Failure data is obtainable through other established means (EPIX/Maint. Rule)
- Examples imply contention with licensee operability determinations
 - Significant conditions are reportable under existing criteria

Clarity of New Criterion

- Unclear rule and/or guidance can lead to wide range of interpretation
- No definition of “required corrective action”
 - What is required?
 - Restore margin or restore operability?
 - What is regulatory basis for margin?
 - What is meant by ensure?
 - Does it differ from enhancing reliability?

Clarity of New Criterion (Continued)

- Physical modification/corrective action to component in question OR “other” (*e.g.*, procedure change, configuration change, comp measure)?
- Timing between conditions is not defined (no time period specified)
 - Differences between corrective action times
 - Differences between discovery of new condition and previous similar occurrence

Impact of New Criterion

- More LERs will be required with increased licensee and NRC burden
- More discussions with inspection staff over interpretation disagreements - what constitutes “required” corrective action?

Impact of New Criterion (Continued)

- Rule change creates implied need for documented basis for conclusions about implications for other systems/trains
 - Likely to Result in Additional Inspections & Equipment Unavailability to Avoid Contention

Impact of New Criterion (Continued)

- Increased burden on trending programs
- Chilling effect on licensee decisions to make voluntary enhancements

NRC Examples

COMMENTS

- From reviewing each example similar comments were identified on each specific example

COMMENTS (CON'T)

- Threshold for reportability from degraded condition standpoint
 - GL 91-18 defines OPERABILITY, there is no similar guidance for defining degraded but OPERABLE. There would have to be guidance generated to make this new criteria less susceptible to interpretation
- Voluntary actions will become reportable

COMMENTS (CON'T)

- Level of corrective action that becomes reportable (i.e., physical change, procedural enhancements, etc...)
- Examples provided will lead to regulation by example and/or inspection

COMMENTS (CON'T)

- Penalized for being proactive
- By example, the difference between the two criteria (i.e., new criteria vs. (a)(2)(vii)) is OPERABILITY