

**Nuclear Regulatory Commission  
Region II  
March 10, 2003**

**Harris Nuclear Plant**

**Fire Protection**



**Attendees**

- Bob Duncan – Director, Site Operations
- Abdy Khanpour – Manager, Engineering
- Eric McCartney – Superintendent, Engineering
- Terry Morton – Manager, Support Services
- John Caves – Supervisor, Licensing
- John Yadusky – Licensing Engineer
- George Attarian – Corporate Chief Engineer
- Jeff Ertman – Corporate Fire Protection Engineer
- Steve Laur – Supervisor, PSA



H/14

## Agenda

- Overview of Fire Protection Inspection Findings
- Summary of Root Causes
- Corrective Actions
- Overview of Project Plan

*other progress.*  
*- short*  
*- medium*  
*- long-term*



## Overview of Inspection Findings

- Failure to identify cables potentially affected by fires
- Inconsistency between Safe Shutdown Analysis and implementing procedure
- Some non-feasible manual actions → *Fuses*
- Technical compliance
  - ▶ Lighting ✓
  - ▶ Manual actions not approved ✓

*SSA*  
*Equation Procedure*

*Series*  
*Fire Area - Analyze*



*Philosophy shift ⇒*  
*Protect 1 train any area*  
*later ⇒ protect train depending on fire area*

1. Hengch.
2. Cable wrap

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## Summary of Root Causes

- Original licensing mid 1980s
  - Errors in analysis
  - Separation issues resolved with using manual actions as the first choice
  - Abnormal Operating Procedure (AOP) for safe shutdown was a single procedure for both MCR fire and plant area fires
  - Applied a rigorous validation process for remote shutdown manual actions
  - Original submittal did not separate remote shutdown from MCR shutdown

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[used a lot.]

1 submittal  
Difficult to tell which 34.  
34 3 areas.

1 AOP

## Summary of Root Causes

- Early 1990s
  - Separated fire response into two AOPs
  - Distinction between manual actions for remote shutdown and 3.G.2 areas not made
  - Validation not done for manual actions in 3.G.2 areas
  - Assessments focused on conventional fire protection – barriers, detection, suppression, equipment impairments

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all of problems - not put together.

C.R. fire design have fire.

remote S/D

could affect other areas

⇒ Remote shutdown panel ⇒ solid validation ⇒  
thru-hydraulic fire  
⇒ Other procedures ⇒ manual actions - part of  
high operators did not have a validation

Jan 2002  
NGG handwager.  
Aug Regan wrote  
2 CR No progress  
not designed to  
BTP. 9.5.1

1. Analysis error.  
2. Clean method on how to deal with MCCS. Didn't do the shutdown approach. No validation.  
3. No process.  
4. Self assessment.

## Fire Protection Corrective Actions

Interim immediate actions completed

- Revised Safe Shutdown Procedures
- Assigned 1 Additional SSD AO To Shift
- De-energized MOVs Where Possible To Eliminate Hot Short Potential
- Removed plexiglas cover for TDAFW fuse
- Established fire watch coverage for identified issues

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① USG  
BAT ⇒ Revise  
to use RWST

② Wrong MCS

③ Enhanced early  
detection. Set  
AUO ⇒ S/D eq,  
early assessment

→ Control room can make  
early decision to deenergize  
equipment.

Removes control  
circuit of TDAFW  
from ACP  
room

Also LPR  
HPR

## On-Shift Staffing

- Developed drill scenarios for ACP fire area using Plant Simulator

▶ Conducted drill scenarios with spurious  
actuators inserted for all 5 shifts with 1  
Auxiliary Operator

▶ All crews successful in achieving shutdown  
▶ Success defined by remote shutdown time  
line

▶ Will validate all remaining fire areas

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Gives an idea  
how the plant is  
responding. Not  
a thermohydraulic  
analysis  
No problems  
noted.

Some failures,  
hot shorts  
added - Always  
able to  
H.S. ⇒ Cold S/L  
72-hours.

No loss of CCP/CCW. ⇒ Will be done in future  
runs.

\* Also included  
loop.  
Revised CCP duties to allow  
him to move.



□ ACP room ] → recognized couldn't proceed all the way because of the manual action issue

DSSA → Analysis complete / training / procedure.

① Fire watch - present → Roving

① Recognized needed NRP permission

^

## Project Plan Goals

- Restore compliance for identified deficiencies
- Fire Hazards Analysis design validation
  - SSA validation
  - Clear documentation of compliance
- Validation of fire response
  - Design adequately reflected in operational response procedures
- Training

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Risk to prioritize

Wrap cables  
Minimize man  
actions -

⇒ 100% validation of SSA.

⇒ Operators / Actions

⇒ Will also validate process for safe shutdown. Needs to be more focused on areas → Faults

Eliminate equipment failures not possible for fires in that area

## Project Plan Goals

- Improve system reliability
  - Validate QA program → Fall down.
  - Optimize surveillances and testing
- Reduce plant risk for operational implementation
  - Reduce operator manual actions to the greatest extent possible
- Improve self-evaluation
  - Establish program health monitoring schedule that verifies design basis through implementation on a periodic basis

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Operators can generate plant from manual actions.

Verticle slice never done on this program

## Project Plan Scope

- Results of root cause analysis
- Corrective action program trends
- Industry issues
- Identified 14 tasks to be included in plan
  - Design modifications
  - Benchmarking } → Start safety & compliance
  - Administrative control upgrades → in particular transient combustion

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## Project Plan Schedule

- SSA validation
  - Contractor selection in progress
  - Begin prior to R11
  - Expected completion in mid 2004

→ Expect some discovery.

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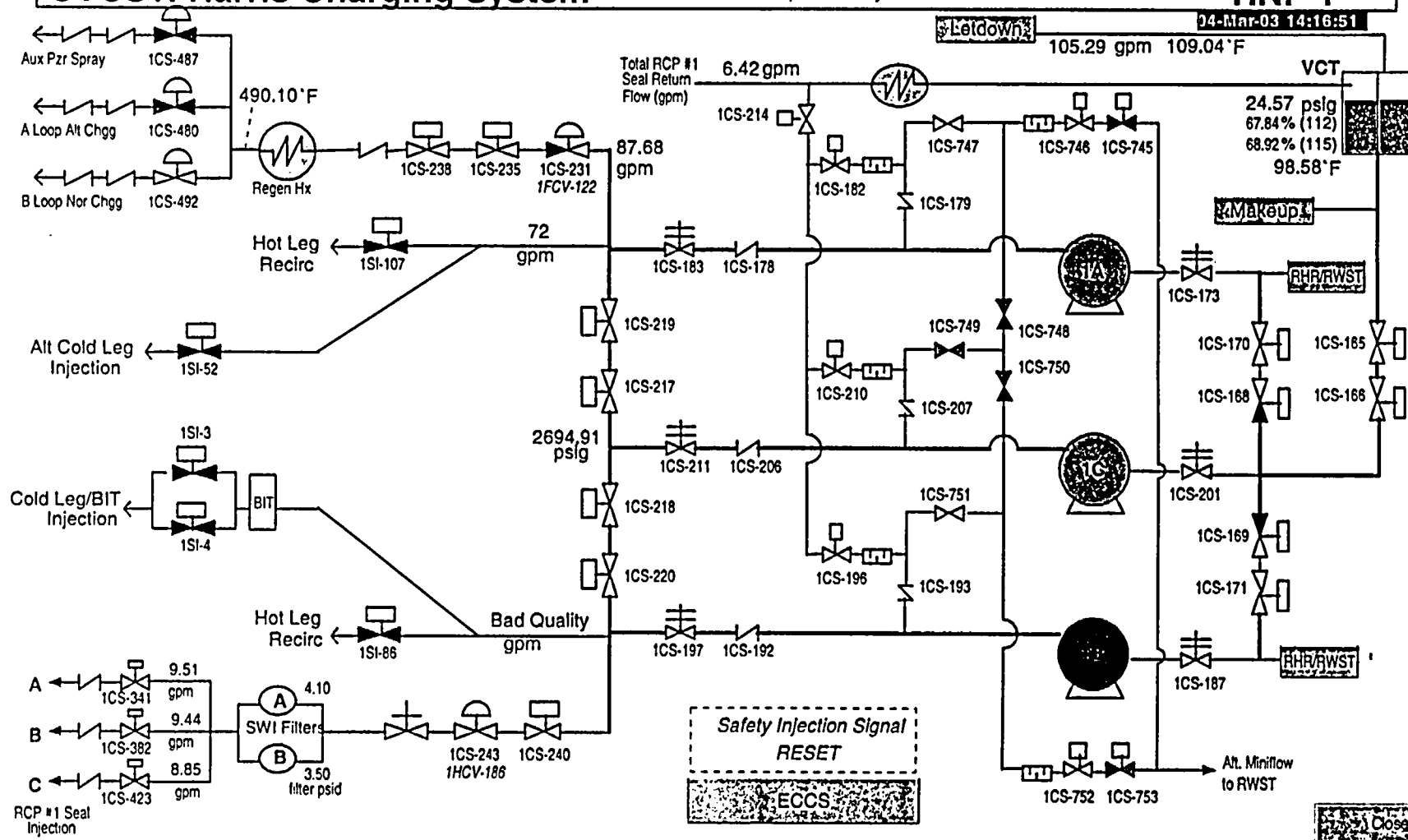
12

# CVCS1: Harris Charging System

For Information Purposes Only

HNP 1

04-Mar-03 14:16:51





## Resolution

### ● Immediate Design Changes

- Design in progress
  - ◆ VCT outlet valve cables, 1CS-165 & 166
  - ◆ Protect CSIP flow paths in all fire events
  - ◆ Eliminate manual actions in ACP fire area
  - ◆ Utilize Interam fire wrap, qualified to GL 86-10, Supplement 1 standards
- Evaluating MCC hot short solutions
  - ◆ Cable reroutes
  - ◆ Valve interlocks

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May need to  
reroute power  
supplies.

R-12.

## Design Validation

### ● Validation of SSA

- Develop safe shutdown equipment list
- Select SSEL cables
- Load cable database
- Utilize automated software analysis methods
- Revise safe shutdown procedure

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Proven track  
history.

Iterative  
process

Will look  
to ~~revisit~~  
use them

## Additional Program Improvements

- Administrative controls
  - Transient combustibles
- Training and Qualification
  - Program manager
  - General engineering population
  - Operations crews
  - Station management

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*Continuing*

*Very little outside influence*

*Safe s/p not well understood*

*Need to consider strategic thinking.*

*don't always have SSA in mind.*

## Risk Insight

- Fire areas identified in findings, except ACP room, have full detection and suppression
- Affected cable routes are greater than 20 feet from fixed ignition sources
- Multiple hot short spurious actions are required to cause loss of a safe shutdown function

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*multiple spurious & some fire available.*

## Summary

- Original design used manual actions instead of separation
- HNP now understands regulatory requirements and safety impact of manual actions
- Aggressively pursuing resolution of known issues and validation of remainder of analysis
- Propose quarterly update meetings with Region II
- HNP will update LER as necessary to include additional discovery

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85, 87, 1  
70's

will try to  
eliminate.

⇒ NEI / RC substitution board.

Hinnant ⇒ Fleet problem.

Cultural transition progress