PPPL DESIGN REVIEW CHIT

WP # 1421 (ENG-032)

CHIT # 1

COMPONENT/SUBSYSTEM/SYSTEM NCSX Power System protection	X	PEER
	☐	CDR
COGNIZANT DESIGN ENGINEER Ramakrishnan DATE OF REVIEW 02/22/08	☐	PDR
	☐	FDR

SUBJECT: (CHECK AS APPLICABLE)

☒ REQUIREMENTS   ☐ HARDWARE   ☐ SAFETY
☐ ANALYSIS   ☐ CONFIGURATION   ☐ COST/SCHEDULE
☐ PERFORMANCE   ☐ RELIABILITY/MAINTAINABILITY ☐ QUALITY

COMMENT/CONCERN/RECOMMENDATION IT IS NOT CLEAR THAT
▲ THERE ARE CONSISTENT SETS OF REQUIREMENTS
THAT BOTH MACHINE/POWER SYSTEMS/PROTECTION
ENGINEERS BOTH UNDERSTAND AND AGREE TO.
THIS SHOULD BE DOCUMENTED IN WRITING BEFORE
A PROPER DESIGN IS APPROVED.

ORIGINATOR :
NAME/ORGANIZATION HATCHER

REVIEW BOARD COMMENT/RECOMMENDATION
(Address technical, cost, and schedule impacts as appropriate. If CHIT is not adopted, provide technical reason
- do not simply state "out-of-scope or N/A" without explaining.)

0 CONCUR
0 DISAGREE
0 OTHER   CHAIRPERSON _____   DATE: _____

COGNIZANT DESIGN ENGINEER'S RESPONSE/DISPOSITION:

SIGNATURE   DATE:

0 APPROVE COG DISPOSITION
0 DISAPPROVE COG DISPOSITION   SIGNATURE _____ DATE: _____

COGNIZANT DESIGN ENGINEER CLOSE-OUT
Sign when action required by disposition is complete.

SIGNATURE _____   DATE: _____

ENG-033 Rev. 0

PPPL DESIGN REVIEW CHIT

WP # 1421 (ENG-032)

CHIT # 2

COMPONENT/SUBSYSTEM/SYSTEM NCSX Power System protection

COGNIZANT DESIGN ENGINEER Ramakrishnan   DATE OF REVIEW 02/22/08

X	PEER
☐	CDR
☐	PDR
☐	FDR

SUBJECT: (CHECK AS APPLICABLE)

☐ REQUIREMENTS   ☐ HARDWARE   ☐ SAFETY
☐ ANALYSIS   ☐ CONFIGURATION   ☐ COST/SCHEDULE
☐ PERFORMANCE   ☐ RELIABILITY/MAINTAINABILITY   ☐ QUALITY

COMMENT/CONCERN/RECOMMENDATION

Current measurements using shunts, and control via Robicon PS, may not provide adequate precision. Required precision should be specified.

ORIGINATOR : C. Neumeyer
NAME/ORGANIZATION

REVIEW BOARD COMMENT/RECOMMENDATION
(Address technical, cost, and schedule impacts as appropriate. If CHIT is not adopted, provide technical reas
- do not simply state "out-of-scope or N/A" without explaining.)

0 CONCUR
0 DISAGREE
0 OTHER   CHAIRPERSON _____   DATE: _____

COGNIZANT DESIGN ENGINEER'S RESPONSE/DISPOSITION:

SIGNATURE _____   DATE: _____

0   APPROVE COG DISPOSITION
0   DISAPPROVE COG DISPOSITION   SIGNATURE _____ DATE:_____

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PPPL DESIGN REVIEW CHIT

WP # 1421 (ENG-032)

CHIT # 3

COMPONENT/SUBSYSTEM/SYSTEM <u>NCSX Power System protection</u>

X	PEER
☐	CDR
☐	PDR
☐	FDR

COGNIZANT DESIGN ENGINEER <u>Ramakrishnan</u>   DATE OF REVIEW <u>02/22/08</u>

SUBJECT: (CHECK AS APPLICABLE)

☑ REQUIREMENTS	☑ HARDWARE	☐ SAFETY
☐ ANALYSIS	☑ CONFIGURATION	☐ COST/SCHEDULE
☑ PERFORMANCE	☐ RELIABILITY/MAINTAINABILITY	☐ QUALITY

COMMENT/CONCERN/RECOMMENDATION

Requirements for e-beam mapping include good accuracy at reduced current, but no feedback. The ESAT Robicons exhibit significant ripple at low current, and may not be accurately preprogrammed with the internal shunts.

ORIGINATOR: R. Majeski, PPPL
NAME/ORGANIZATION

REVIEW BOARD COMMENT/RECOMMENDATION
(Address technical, cost, and schedule impacts as appropriate. If CHIT is not adopted, provide technical reaso
- do not simply state "out-of-scope or N/A" without explaining.)

0 CONCUR
0 DISAGREE
0 OTHER

CHAIRPERSON _____   DATE: _____

COGNIZANT DESIGN ENGINEER'S RESPONSE/DISPOSITION:

SIGNATURE _____   DATE: _____

0 APPROVE COG DISPOSITION
0 DISAPPROVE COG DISPOSITION

SIGNATURE _____   DATE: _____

COGNIZANT DESIGN ENGINEER CLOSE-OUT
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SIGNATURE _____   DATE: _____

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PPPL DESIGN REVIEW CHIT

WP # _____ (ENG-032)

CHIT # __4__

COMPONENT/SUBSYSTEM/SYSTEM _____

COGNIZANT DESIGN ENGINEER _____ DATE OF REVIEW _____

- ☐ PEER
- ☐ CDR
- ☐ PDR
- ☐ FDR

SUBJECT: (CHECK AS APPLICABLE)

- ☐ REQUIREMENTS
- ☐ ANALYSIS
- ☐ PERFORMANCE
- ☐ HARDWARE
- ☐ CONFIGURATION
- ☐ RELIABILITY/MAINTAINABILITY
- ☐ SAFETY
- ☐ SECURITY & SAFEGUARDS
- ☐ COST/SCHEDULE
- ☐ QUALITY

COMMENT/CONCERN/RECOMMENDATION

Recommend redundant current measurements and current-related protection in each coil circuit.

ORIGINATOR _ C. Neumeyer

NAME/ORGANIZATION

REVIEW BOARD COMMENT/RECOMMENDATION
(Address technical, cost, and schedule impacts as appropriate. If CHIT is not adopted, provide technical reason - do no simply state "out-of-scope or N/A" without explaining.)

0 CONCUR
0 DISAGREE
0 OTHER

CHAIRPERSON _____ DATE: _____

COGNIZANT DESIGN ENGINEER'S RESPONSE/DISPOSITION:

SIGNATURE _____ DATE: _____

RESPONSIBLE RLM REVIEW

0   APPROVE COG DISPOSITION
0   DISAPPROVE COG DISPOSITION

SIGNATURE _____ DATE: _____

COGNIZANT DESIGN ENGINEER CLOSE-OUT
Sign when action required by disposition is complete.

SIGNATURE _____ DATE: _____

PPPL DESIGN REVIEW CHIT

WP # _____ (ENG-032)

CHIT # 5

COMPONENT/SUBSYSTEM/SYSTEM _____

COGNIZANT DESIGN ENGINEER _____ DATE OF REVIEW _____

- ☐ PEER
- ☐ CDR
- ☐ PDR
- ☐ FDR

SUBJECT: (CHECK AS APPLICABLE)

- ☐ REQUIREMENTS
- ☐ ANALYSIS
- ☐ PERFORMANCE
- ☐ HARDWARE
- ☐ CONFIGURATION
- ☐ RELIABILITY/MAINTAINABILITY
- ☐ SAFETY
- ☐ SECURITY & SAFEGUARDS
- ☐ COST/SCHEDULE
- ☐ QUALITY

COMMENT/CONCERN/RECOMMENDATION

Need to confirm that levels of currents permitted in coils by overcurrent protection will not violate structural limits. Otherwise, need smarter protection.

ORIGINATOR — C. Neumeyer

NAME/ORGANIZATION

REVIEW BOARD COMMENT/RECOMMENDATION
(Address technical, cost, and schedule impacts as appropriate. If CHIT is not adopted, provide technical reason - do no simply state "out-of-scope or N/A" without explaining.)

0 CONCUR
0 DISAGREE
0 OTHER   CHAIRPERSON _____ DATE: _____

COGNIZANT DESIGN ENGINEER'S RESPONSE/DISPOSITION:

SIGNATURE _____ DATE: _____

RESPONSIBLE RLM REVIEW

0 APPROVE COG DISPOSITION
0 DISAPPROVE COG DISPOSITION   SIGNATURE _____ DATE: _____

COGNIZANT DESIGN ENGINEER CLOSE-OUT
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SIGNATURE _____ DATE: _____

PPPL DESIGN REVIEW CHIT

CHIT # 6

COMPONENT/SUBSYSTEM/SYSTEM NCSX Power System protection		X	PEER
		☐	CDR
COGNIZANT DESIGN ENGINEER Ramakrishnan DATE OF REVIEW 02/22/08		☐	PDR
		☐	FDR

SUBJECT: (CHECK AS APPLICABLE)

☐ REQUIREMENTS   ☐ HARDWARE   ☐ SAFETY
☐ ANALYSIS   ☐ CONFIGURATION   ☐ COST/SCHEDULE
☐ PERFORMANCE   ☐ RELIABILITY/MAINTAINABILITY   ☐ QUALITY

COMMENT/CONCERN/RECOMMENDATION

Recommend use of combination of outlet coolant measurement plus pulse period and duration timer for 1st plasma protection against coil overheating for PF/TF coils.

ORIGINATOR:
NAME/ORGANIZATION   C. Neumeyer

REVIEW BOARD COMMENT/RECOMMENDATION
(Address technical, cost, and schedule impacts as appropriate. If CHIT is not adopted, provide technical reason - do not simply state "out-of-scope or N/A" without explaining.)

— For modular coils, due to indirect cooling, another method is needed.

0 CONCUR
0 DISAGREE
0 OTHER   CHAIRPERSON _____ DATE: _____

COGNIZANT DESIGN ENGINEER'S RESPONSE/DISPOSITION:

SIGNATURE _____ DATE: _____

0 APPROVE COG DISPOSITION
0 DISAPPROVE COG DISPOSITION   SIGNATURE _____ DATE: _____

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PPPL DESIGN REVIEW CHIT

WP # **1421** (ENG-032)

CHIT # **7**

COMPONENT/SUBSYSTEM/SYSTEM NCSX Power System protection

COGNIZANT DESIGN ENGINEER Ramakrishnan **DATE OF REVIEW** 02/22/08

X	PEER
☐	CDR
☐	PDR
☐	FDR

SUBJECT: (CHECK AS APPLICABLE)

☒ REQUIREMENTS ☒ HARDWARE ☐ SAFETY
☐ ANALYSIS ☒ CONFIGURATION ☐ COST/SCHEDULE
☐ PERFORMANCE ☒ RELIABILITY/MAINTAINABILITY ☐ QUALITY

COMMENT/CONCERN/RECOMMENDATION

RATHER THAN DEPEND ON TIME-BASED PROTECTION
WHY NOT DO EITHER REAL MEASUREMENTS OR SIMULATIONS
VIA HARDWARE FOR SOME OF THESE PROTECTION
FEATURES

ORIGINATOR :
NAME/ORGANIZATION HATCHER

REVIEW BOARD COMMENT/RECOMMENDATION
(Address technical, cost, and schedule impacts as appropriate. If CHIT is not adopted, provide technical reaso
- do not simply state "out-of-scope or N/A" without explaining.)

0 CONCUR
0 DISAGREE
0 OTHER CHAIRPERSON _____ DATE: _____

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SIGNATURE _____ DATE: _____

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0 DISAPPROVE COG DISPOSITION SIGNATURE _____ DATE: _____

COGNIZANT DESIGN ENGINEER CLOSE-OUT
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PPPL DESIGN REVIEW CHIT

WP # _____ (ENG-032)

CHIT # ___8___

COMPONENT/SUBSYSTEM/SYSTEM _____

☐ PEER
☐ CDR
☐ PDR
☐ FDR

COGNIZANT DESIGN ENGINEER _____ DATE OF REVIEW _____

SUBJECT: (CHECK AS APPLICABLE)

☐ REQUIREMENTS ☐ HARDWARE ☐ SAFETY
☐ ANALYSIS ☐ CONFIGURATION ☐ SECURITY & SAFEGUARDS
☐ PERFORMANCE ☐ RELIABILITY/MAINTAINABILITY ☐ COST/SCHEDULE
☐ QUALITY

COMMENT/CONCERN/RECOMMENDATION

Design a coil resistance measurement system needs
to be developed so that the need for voltage sense
leads directly on the modular coil terminals can be
assessed.

ORIGINATOR __

NAME/ORGANIZATION C Neumeyer

REVIEW BOARD COMMENT/RECOMMENDATION

(Address technical, cost, and schedule impacts as appropriate. If CHIT is not adopted, provide technical reason - do not simply state "out-of-scope or N/A" without explaining.)

0 CONCUR
0 DISAGREE
0 OTHER   CHAIRPERSON _____ DATE: _____

COGNIZANT DESIGN ENGINEER'S RESPONSE/DISPOSITION:

SIGNATURE _____ DATE: _____

RESPONSIBLE RLM REVIEW

0 APPROVE COG DISPOSITION
0 DISAPPROVE COG DISPOSITION   SIGNATURE _____ DATE: _____

COGNIZANT DESIGN ENGINEER CLOSE-OUT

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SIGNATURE _____ DATE: _____

PPPL DESIGN REVIEW CHIT

WP # 1421 (ENG-032)

CHIT # 9

COMPONENT/SUBSYSTEM/SYSTEM NCSX Power System protection		
COGNIZANT DESIGN ENGINEER Ramakrishnan DATE OF REVIEW 02/22/08		

- X PEER
- ☐ CDR
- ☐ PDR
- ☐ FDR

SUBJECT: (CHECK AS APPLICABLE)

- ☐ REQUIREMENTS
- ☐ ANALYSIS
- ☐ PERFORMANCE
- ☐ HARDWARE
- ☐ CONFIGURATION
- ☐ RELIABILITY/MAINTAINABILITY
- ☐ SAFETY
- ☐ COST/SCHEDULE
- ☐ QUALITY

COMMENT/CONCERN/RECOMMENDATION

Ratings of Robicon rectifiers needs to be documented. Capacity of Robicon rectifiers to supply 1st plasma and e-beam waveforms (voltage, current, heating of rectifiers, etc.) needs to be confirmed.

ORIGINATOR :
NAME/ORGANIZATION
C. Neumeyer

REVIEW BOARD COMMENT/RECOMMENDATION
(Address technical, cost, and schedule impacts as appropriate. If CHIT is not adopted, provide technical reason - do not simply state "out-of-scope or N/A" without explaining.)

0 CONCUR
0 DISAGREE
0 OTHER

CHAIRPERSON _____ DATE: _____

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0 DISAPPROVE COG DISPOSITION

SIGNATURE _____ DATE: _____

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Sign when action required by disposition is complete.

SIGNATURE _____ DATE: _____

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PPPL DESIGN REVIEW CHIT

CHIT # 10

COMPONENT/SUBSYSTEM/SYSTEM NCSX Power System protection	X PEER
	☐ CDR
COGNIZANT DESIGN ENGINEER Ramakrishnan DATE OF REVIEW 02/22/08	☐ PDR
	☐ FDR

SUBJECT: (CHECK AS APPLICABLE)

☑ REQUIREMENTS ☑ HARDWARE ☐ SAFETY
☑ ANALYSIS ☑ CONFIGURATION ☐ COST/SCHEDULE
☑ PERFORMANCE ☐ RELIABILITY/MAINTAINABILITY ☐ QUALITY

COMMENT/CONCERN/RECOMMENDATION

Is the present power supply cooling system for the Robicons adequate? Are repairs needed?

ORIGINATOR : R. Majerski, PPPL
NAME/ORGANIZATION

REVIEW BOARD COMMENT/RECOMMENDATION
(Address technical, cost, and schedule impacts as appropriate. If CHIT is not adopted, provide technical reaso
- do not simply state "out-of-scope or N/A" without explaining.)

0 CONCUR
0 DISAGREE
0 OTHER   CHAIRPERSON _____ DATE: _____

COGNIZANT DESIGN ENGINEER'S RESPONSE/DISPOSITION:

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0 DISAPPROVE COG DISPOSITION   SIGNATURE _____ DATE: _____

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PPPL DESIGN REVIEW CHIT

COMPONENT/SUBSYSTEM/SYSTEM NCSX Power System protection	X PEER
	☐ CDR
COGNIZANT DESIGN ENGINEER Ramakrishnan DATE OF REVIEW 02/22/08	☐ PDR
	☐ FDR

SUBJECT: (CHECK AS APPLICABLE)

☐ REQUIREMENTS   ☐ HARDWARE   ☐ SAFETY
☐ ANALYSIS   ☐ CONFIGURATION   ☐ COST/SCHEDULE
☐ PERFORMANCE   ☐ RELIABILITY/MAINTAINABILITY   ☐ QUALITY

COMMENT/CONCERN/RECOMMENDATION

Need to confirm that L/R coil current
decay is within Robicon PS capability
in case of fault (eg. breaker trip)
since there is no bypass. ORIGINATOR : C. Neumeyer
NAME/ORGANIZATION

REVIEW BOARD COMMENT/RECOMMENDATION

(Address technical, cost, and schedule impacts as appropriate. If CHIT is not adopted, provide technical reaso
- do not simply state "out-of-scope or N/A" without explaining.)

0 CONCUR
0 DISAGREE
0 OTHER   CHAIRPERSON _____ DATE: _____

COGNIZANT DESIGN ENGINEER'S RESPONSE/DISPOSITION:

SIGNATURE _____ DATE: _____

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0 DISAPPROVE COG DISPOSITION   SIGNATURE _____ DATE: _____

COGNIZANT DESIGN ENGINEER CLOSE-OUT

Sign when action required by disposition is complete.

SIGNATURE _____ DATE: _____

PPPL DESIGN REVIEW CHIT

WP # 1421 (ENG-032)

CHIT # 12

COMPONENT/SUBSYSTEM/SYSTEM NCSX Power System protection

COGNIZANT DESIGN ENGINEER Ramakrishnan DATE OF REVIEW 02/22/08

X	PEER
☐	CDR
☐	PDR
☐	FDR

SUBJECT: (CHECK AS APPLICABLE)

☑ REQUIREMENTS ☑ HARDWARE ☑ SAFETY
☑ ANALYSIS ☐ CONFIGURATION ☐ COST/SCHEDULE
☑ PERFORMANCE ☐ RELIABILITY/MAINTAINABILITY ☐ QUALITY

COMMENT/CONCERN/RECOMMENDATION

Consider developing an emergency ramp-down capability
for the PLC control system, also for use during e-beam
ramping. For example, a 10 msec ramp down from 1900A will
produce an LdI/dt at 5kV on M2,M3.

ORIGINATOR: R. Majeski, PPPL
NAME/ORGANIZATION

REVIEW BOARD COMMENT/RECOMMENDATION
(Address technical, cost, and schedule impacts as appropriate. If CHIT is not adopted, provide technical reaso
- do not simply state "out-of-scope or N/A" without explaining.)

0 CONCUR
0 DISAGREE
0 OTHER

CHAIRPERSON _____ DATE: _____

COGNIZANT DESIGN ENGINEER'S RESPONSE/DISPOSITION:

SIGNATURE _____ DATE: _____

0 APPROVE COG DISPOSITION
0 DISAPPROVE COG DISPOSITION

SIGNATURE _____ DATE: _____

COGNIZANT DESIGN ENGINEER CLOSE-OUT
Sign when action required by disposition is complete.

SIGNATURE _____ DATE: _____

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PPPL DESIGN REVIEW CHIT

WP # **1421** (ENG-032)

CHIT # 13

COMPONENT/SUBSYSTEM/SYSTEM NCSX Power System protection	
COGNIZANT DESIGN ENGINEER Ramakrishnan DATE OF REVIEW 02/22/08	X PEER ☐ CDR ☐ PDR ☐ FDR

SUBJECT: (CHECK AS APPLICABLE)

☐ REQUIREMENTS   ☐ HARDWARE   ☐ SAFETY
☐ ANALYSIS   ☐ CONFIGURATION   ☐ COST/SCHEDULE
☐ PERFORMANCE   ☐ RELIABILITY/MAINTAINABILITY   ☐ QUALITY

COMMENT/CONCERN/RECOMMENDATION

A failure Mode Analysis is required to insure protection meets this requirement

ORIGINATOR :
NAME/ORGANIZATION

REVIEW BOARD COMMENT/RECOMMENDATION
(Address technical, cost, and schedule impacts as appropriate. If CHIT is not adopted, provide technical reaso
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0 CONCUR
0 DISAGREE
0 OTHER   CHAIRPERSON _____ DATE: _____

COGNIZANT DESIGN ENGINEER'S RESPONSE/DISPOSITION:

SIGNATURE   DATE:

0 APPROVE COG DISPOSITION 0 DISAPPROVE COG DISPOSITION	SIGNATURE _____ DATE:_____

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SIGNATURE _____ DATE: _____

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PPPL DESIGN REVIEW CHIT

WP # 1421 (ENG-032)

CHIT # 14

COMPONENT/SUBSYSTEM/SYSTEM NCSX Power System protection		X PEER
		☐ CDR
COGNIZANT DESIGN ENGINEER Ramakrishnan DATE OF REVIEW 02/22/08		☐ PDR
		☐ FDR

SUBJECT: (CHECK AS APPLICABLE)

☐ REQUIREMENTS   ☐ HARDWARE   ☑ SAFETY
☑ ANALYSIS   ☐ CONFIGURATION   ☐ COST/SCHEDULE
☐ PERFORMANCE   ☐ RELIABILITY/MAINTAINABILITY   ☐ QUALITY

COMMENT/CONCERN/RECOMMENDATION

Please ensure that a comprehensive
Failure Mode Effects Analysis is presented
during the FDR. FMEA should identify all
single point failures and   ORIGINATOR: CA Gentile
      NAME/ORGANIZATION
mitigation systems. Also please send me these,

REVIEW BOARD COMMENT/RECOMMENDATION
(Address technical, cost, and schedule impacts as appropriate. If CHIT is not adopted, provide technical reaso~~n~~
- do not simply state "out-of-scope or N/A" without explaining.)

→ FMEA's so that I can include these in the
PCSX Safety Assessment Document.

0 CONCUR
0 DISAGREE
0 OTHER

CHAIRPERSON _____ DATE: _____

COGNIZANT DESIGN ENGINEER'S RESPONSE/DISPOSITION:

SIGNATURE _____ DATE: _____

0 APPROVE COG DISPOSITION
0 DISAPPROVE COG DISPOSITION

SIGNATURE _____ DATE: _____

COGNIZANT DESIGN ENGINEER CLOSE-OUT
Sign when action required by disposition is complete.

SIGNATURE _____ DATE: _____

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PPPL DESIGN REVIEW CHIT

CHIT # 15

COMPONENT/SUBSYSTEM/SYSTEM NCSX Power System protection	☒ PEER
	☐ CDR
COGNIZANT DESIGN ENGINEER Ramakrishnan DATE OF REVIEW 02/22/08	☐ PDR
	☐ FDR

SUBJECT: (CHECK AS APPLICABLE)

☐ REQUIREMENTS   ☑ HARDWARE   ☑ SAFETY
☐ ANALYSIS   ☐ CONFIGURATION   ☐ COST/SCHEDULE
☑ PERFORMANCE   ☐ RELIABILITY/MAINTAINABILITY   ☐ QUALITY

COMMENT/CONCERN/RECOMMENDATION

Consider using / installing several fiber-optic
configured therm-couples to provide ability to
collect real time ΔT measurements for the TF
and modular field coils.

ORIGINATOR :
NAME/ORGANIZATION   CA Gentile

REVIEW BOARD COMMENT/RECOMMENDATION
(Address technical, cost, and schedule impacts as appropriate. If CHIT is not adopted, provide technical reason
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0 CONCUR
0 DISAGREE
0 OTHER   CHAIRPERSON _____   DATE: _____

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SIGNATURE _____   DATE: _____

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0 DISAPPROVE COG DISPOSITION   SIGNATURE _____   DATE: _____

COGNIZANT DESIGN ENGINEER CLOSE-OUT
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SIGNATURE _____   DATE: _____

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PPPL DESIGN REVIEW CHIT

CHIT # 16

COMPONENT/SUBSYSTEM/SYSTEM NCSX Power System protection

X	PEER
☐	CDR
☐	PDR
☐	FDR

COGNIZANT DESIGN ENGINEER Ramakrishnan **DATE OF REVIEW** 02/22/08

SUBJECT: (CHECK AS APPLICABLE)

☐ REQUIREMENTS   ☐ HARDWARE   ☐ SAFETY
☐ ANALYSIS   ☐ CONFIGURATION   ☐ COST/SCHEDULE
☐ PERFORMANCE   ☐ RELIABILITY/MAINTAINABILITY   ☐ QUALITY

COMMENT/CONCERN/RECOMMENDATION

Any PLC's used should consider their the criticality of their application (personell safety, equipment protection), and the use of private or NCSX-public networks, and integration with Central Controls.

ORIGINATOR :
NAME/ORGANIZATION

P Schtz

REVIEW BOARD COMMENT/RECOMMENDATION
(Address technical, cost, and schedule impacts as appropriate. If CHIT is not adopted, provide technical reaso
- do not simply state "out-of-scope or N/A" without explaining.)

0 CONCUR
0 DISAGREE
0 OTHER   CHAIRPERSON _____ DATE: _____

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SIGNATURE _____ DATE: _____

0 APPROVE COG DISPOSITION
0 DISAPPROVE COG DISPOSITION   SIGNATURE _____ DATE: _____

COGNIZANT DESIGN ENGINEER CLOSE-OUT
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SIGNATURE _____ DATE: _____

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PPPL DESIGN REVIEW CHIT

CHIT # 17

COMPONENT/SUBSYSTEM/SYSTEM NCSX Power System protection

COGNIZANT DESIGN ENGINEER Ramakrishnan DATE OF REVIEW 02/22/08

X PEER
☐ CDR
☐ PDR
☐ FDR

SUBJECT: (CHECK AS APPLICABLE)

☐ REQUIREMENTS   ☐ HARDWARE   ☐ SAFETY
☐ ANALYSIS   ☐ CONFIGURATION   ☐ COST/SCHEDULE
☐ PERFORMANCE   ☐ RELIABILITY/MAINTAINABILITY ☐ QUALITY

COMMENT/CONCERN/RECOMMENDATION

The interfaces with the NCSX Access Control
System and Hardwired Interlock System
(WBS5) should be shown. ~~Perhaps block diagrams~~
~~would be~~ ~~Be~~ illustrative.

ORIGINATOR :
NAME/ORGANIZATION P. Sichta

REVIEW BOARD COMMENT/RECOMMENDATION
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0 CONCUR
0 DISAGREE
0 OTHER   CHAIRPERSON _____ DATE: _____

COGNIZANT DESIGN ENGINEER'S RESPONSE/DISPOSITION:

SIGNATURE _____ DATE: _____

0 APPROVE COG DISPOSITION
0 DISAPPROVE COG DISPOSITION   SIGNATURE _____ DATE: _____

COGNIZANT DESIGN ENGINEER CLOSE-OUT
Sign when action required by disposition is complete.

SIGNATURE _____ DATE: _____

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PPPL DESIGN REVIEW CHIT

WP # 1421 (ENG-032)

CHIT # 18

COMPONENT/SUBSYSTEM/SYSTEM NCSX Power System protection

COGNIZANT DESIGN ENGINEER Ramakrishnan **DATE OF REVIEW** 02/22/08

X PEER
☐ CDR
☐ PDR
☐ FDR

SUBJECT: (CHECK AS APPLICABLE)

☐ REQUIREMENTS ☐ HARDWARE ☐ SAFETY
☐ ANALYSIS ☐ CONFIGURATION ☐ COST/SCHEDULE
☐ PERFORMANCE ☐ RELIABILITY/MAINTAINABILITY ☐ QUALITY

COMMENT/CONCERN/RECOMMENDATION

On digital (analog signals) Fiber optic links, since
used For protection, there should be real-time data
validity + perhaps a Fail-safe voltage.
↑ to generate a Fault

ORIGINATOR :
NAME/ORGANIZATION P. Sichta

REVIEW BOARD COMMENT/RECOMMENDATION
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- do not simply state "out-of-scope or N/A" without explaining.)

0 CONCUR
0 DISAGREE
0 OTHER   CHAIRPERSON _____ DATE: _____

COGNIZANT DESIGN ENGINEER'S RESPONSE/DISPOSITION:

SIGNATURE _____ DATE: _____

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0 DISAPPROVE COG DISPOSITION   SIGNATURE _____ DATE: _____

COGNIZANT DESIGN ENGINEER CLOSE-OUT
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SIGNATURE _____ DATE: _____

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PPPL DESIGN REVIEW CHIT

CHIT # 19

COMPONENT/SUBSYSTEM/SYSTEM NCSX Power System protection	X PEER
	☐ CDR
COGNIZANT DESIGN ENGINEER Ramakrishnan DATE OF REVIEW 02/22/08	☐ PDR
	☐ FDR

SUBJECT: (CHECK AS APPLICABLE)

☒ REQUIREMENTS ☐ HARDWARE ☐ SAFETY
☐ ANALYSIS ☐ CONFIGURATION ☐ COST/SCHEDULE
☐ PERFORMANCE ☐ RELIABILITY/MAINTAINABILITY ☐ QUALITY

COMMENT/CONCERN/RECOMMENDATION

Require to provide check + maintain the CS pumps
that one of them is require for proper c.w.
flow to the power supply.

ORIGINATOR : M. Awad
NAME/ORGANIZATION Engineering

REVIEW BOARD COMMENT/RECOMMENDATION
(Address technical, cost, and schedule impacts as appropriate. If CHIT is not adopted, provide technical reaso
- do not simply state "out-of-scope or N/A" without explaining.)

0 CONCUR
0 DISAGREE
0 OTHER   CHAIRPERSON _____   DATE: _____

COGNIZANT DESIGN ENGINEER'S RESPONSE/DISPOSITION:

SIGNATURE _____   DATE: _____

0 APPROVE COG DISPOSITION
0 DISAPPROVE COG DISPOSITION   SIGNATURE _____ DATE: _____

COGNIZANT DESIGN ENGINEER CLOSE-OUT
Sign when action required by disposition is complete.
SIGNATURE _____   DATE: _____

ENG-033 Rev. 0

PPPL DESIGN REVIEW CHIT

CHIT # 20

COMPONENT/SUBSYSTEM/SYSTEM <u>NCSX Power System protection</u>	X PEER ☐ CDR ☐ PDR ☐ FDR
COGNIZANT DESIGN ENGINEER <u>Ramakrishnan</u> DATE OF REVIEW <u>02/22/08</u>	

SUBJECT: (CHECK AS APPLICABLE)

☒ REQUIREMENTS   ☐ HARDWARE   ☐ SAFETY
☐ ANALYSIS   ☐ CONFIGURATION   ☐ COST/SCHEDULE
☐ PERFORMANCE   ☐ RELIABILITY/MAINTAINABILITY   ☐ QUALITY

COMMENT/CONCERN/RECOMMENDATION

Required to repair expansion joint in the de tower cooling water to provide adequate cooling through the heat exchanger.
Cost about $6000.

ORIGINATOR: M. Awad
NAME/ORGANIZATION   Engineering

REVIEW BOARD COMMENT/RECOMMENDATION
(Address technical, cost, and schedule impacts as appropriate. If CHIT is not adopted, provide technical reason
- do not simply state "out-of-scope or N/A" without explaining.)

0 CONCUR
0 DISAGREE
0 OTHER   CHAIRPERSON _____ DATE: _____

COGNIZANT DESIGN ENGINEER'S RESPONSE/DISPOSITION:

SIGNATURE _____ DATE: _____

0   APPROVE COG DISPOSITION
0   DISAPPROVE COG DISPOSITION   SIGNATURE _____ DATE: _____

COGNIZANT DESIGN ENGINEER CLOSE-OUT
Sign when action required by disposition is complete.

SIGNATURE _____ DATE: _____