

NCSX PF Coil Preliminary Design Review

12/14/07

ATTENDANCE

MIKE COLE	OAK RIDGE
CHUCK SWENSON	LANL
Jim Chazanowski	PPPL
S Ramakrishnan	PPPL
C Neumeyer	PPPL
Phil Heitmaneder	PPPL
Mike Cole	ORNL
Judy Malsburg	QA
Bob Simmons	PPPL
Tom Mergler	PPPL
Bruce Paul	PPPL
Steve Radosowicz	PPPL
Hutch Neilson	PPPL
STRYKOWSKY	PPPL
Jim Anderson	PPPL
Frank Malinowski	PPPL
Art Brakes	PPPL
Larry Sutton	PPPL
JOE RUSHINSKI	PPPL
FRED DAHLGREN	PPPL

PPPL DESIGN REVIEW CHIT

WP # _____ (ENG-032)

CHIT # 1

COMPONENT/SUBSYSTEM/SYSTEM NCSX PF COIL PDR

COGNIZANT DESIGN ENGINEER KALISH DATE OF REVIEW 12/14/07

☐ PEER
☐ CDR
☒ PDR
☐ FDR

SUBJECT: (CHECK AS APPLICABLE)

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

COMMENT/CONCERN/RECOMMENDATION

Verify Configuration preserves stellarator symmetry
i.e. Bottom Coils are installed rotated about machine's
axis 180°

ORIGINATOR Art Brooks

NAME/ORGANIZATION

REVIEW BOARD COMMENT/RECOMMENDATION

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

☒ CONCUR
☐ DISAGREE
☐ OTHER

CHAIRPERSON [Signature]

DATE: 12/14/07

COGNIZANT DESIGN ENGINEER'S RESPONSE/DISPOSITION:

SIGNATURE _____ DATE: _____

RESPONSIBLE RLM REVIEW

☐ APPROVE COG DISPOSITION
☐ DISAPPROVE COG DISPOSITION

SIGNATURE _____ DATE: _____

COGNIZANT DESIGN ENGINEER CLOSE-OUT

Sign when action required by disposition is complete.

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PPPL DESIGN REVIEW CHIT

WP # _____ (ENG-032)

CHIT # 2

COMPONENT/SUBSYSTEM/SYSTEM NCSX PF COIL PDR

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COMMENT/CONCERN/RECOMMENDATION

Calculations establishing the voltage, # of turns, & current requirements have to be referred to.

ORIGINATOR _____

NAME/ORGANIZATION _____

REVIEW BOARD COMMENT/RECOMMENDATION

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☒ CONCUR
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PPPL DESIGN REVIEW CHIT

WP # _____ (ENG-032)

CHIT # 3

COMPONENT/SUBSYSTEM/SYSTEM NCSX PF COIL PDR

COGNIZANT DESIGN ENGINEER KALISH DATE OF REVIEW 12/14/07

☐ PEER
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☐ FDR

SUBJECT: (CHECK AS APPLICABLE)

☐ REQUIREMENTS
☐ ANALYSIS
☐ PERFORMANCE

☐ HARDWARE
☐ CONFIGURATION
☐ RELIABILITY/MAINTAINABILITY

☐ SAFETY
☐ COST/SCHEDULE
☐ QUALITY

COMMENT/CONCERN/RECOMMENDATION

Consider using a ground plane.

ORIGINATOR C Neumeyer

NAME/ORGANIZATION

REVIEW BOARD COMMENT/RECOMMENDATION

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☒ CONCUR
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DATE: 12/14/07

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PPPL DESIGN REVIEW CHIT

WP # _____ (ENG-032)

CHIT # 4

COMPONENT/SUBSYSTEM/SYSTEM NCSX PF COIL PDR ☐ PEER
 COGNIZANT DESIGN ENGINEER KALISH DATE OF REVIEW 12/14/07 ☒ CDR
☒ PDR
☐ FDR

SUBJECT: (CHECK AS APPLICABLE)

- | | | |
|---------------------------------------|--|--|
| <input type="checkbox"/> REQUIREMENTS | <input type="checkbox"/> HARDWARE | <input type="checkbox"/> SAFETY |
| <input type="checkbox"/> ANALYSIS | <input type="checkbox"/> CONFIGURATION | <input type="checkbox"/> COST/SCHEDULE |
| <input type="checkbox"/> PERFORMANCE | <input type="checkbox"/> RELIABILITY/MAINTAINABILITY | <input type="checkbox"/> QUALITY |

COMMENT/CONCERN/RECOMMENDATION

Sensor loop may have a noise problem unless there is a shield via a ground plane in coil or around sensor loop. Proper design would place sensor outside of ground plane.

ORIGINATOR C Neumeyer
 NAME/ORGANIZATION

REVIEW BOARD COMMENT/RECOMMENDATION

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

- ☒ CONCUR
☐ DISAGREE
☐ OTHER

CHAIRPERSON [Signature]

DATE: 12/14/07

COGNIZANT DESIGN ENGINEER'S RESPONSE/DISPOSITION:

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RESPONSIBLE RLM REVIEW

- ☐ APPROVE COG DISPOSITION
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PPPL DESIGN REVIEW CHIT

WP # _____ (ENG-032)

CHIT # 5COMPONENT/SUBSYSTEM/SYSTEM NCSX PF COIL PDRCOGNIZANT DESIGN ENGINEER KALISH DATE OF REVIEW 12/14/07☐ PEER
☐ CDR
☒ PDR
☐ FDR**SUBJECT: (CHECK AS APPLICABLE)**☐ REQUIREMENTS
☐ ANALYSIS
☐ PERFORMANCE☐ HARDWARE
☐ CONFIGURATION
☐ RELIABILITY/MAINTAINABILITY☐ SAFETY
☐ COST/SCHEDULE
☐ QUALITY**COMMENT/CONCERN/RECOMMENDATION**Check calculation of turn-to-turn voltage.ORIGINATOR C. Neumeier

NAME/ORGANIZATION

REVIEW BOARD COMMENT/RECOMMENDATION

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

☒ CONCUR
☐ DISAGREE
☐ OTHER

CHAIRPERSON

DATE: 12/14/07**COGNIZANT DESIGN ENGINEER'S RESPONSE/DISPOSITION:**

SIGNATURE _____ DATE: _____

RESPONSIBLE RLM REVIEW☐ APPROVE COG DISPOSITION
☐ DISAPPROVE COG DISPOSITION

SIGNATURE _____ DATE: _____

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PPPL DESIGN REVIEW CHIT

WP # _____ (ENG-032)

CHIT # 6

COMPONENT/SUBSYSTEM/SYSTEM NCSX PF COIL PDR

COGNIZANT DESIGN ENGINEER KALISH DATE OF REVIEW 12/14/07

☐ PEER
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☒ PDR
☐ FDR

SUBJECT: (CHECK AS APPLICABLE)

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

COMMENT/CONCERN/RECOMMENDATION

max turn to turn voltage to
be specified

ORIGINATOR IR

NAME/ORGANIZATION

REVIEW BOARD COMMENT/RECOMMENDATION

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

See #5

☐ CONCUR
☐ DISAGREE
☒ OTHER

CHAIRPERSON [Signature]

DATE: 12/14/07

COGNIZANT DESIGN ENGINEER'S RESPONSE/DISPOSITION:

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RESPONSIBLE RLM REVIEW

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PPPL DESIGN REVIEW CHIT

WP # _____ (ENG-032)

CHIT # 7

COMPONENT/SUBSYSTEM/SYSTEM NCSX PF COIL PDR

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COMMENT/CONCERN/RECOMMENDATION

Need to establish minimum lead-to-lead and lead-to-ground creepage distances for leads to ensure safety margin on leads.

ORIGINATOR C. Neumeyer

NAME/ORGANIZATION

REVIEW BOARD COMMENT/RECOMMENDATION

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

☒ CONCUR
☐ DISAGREE
☐ OTHER

CHAIRPERSON

DATE: 12/14/07

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PPPL DESIGN REVIEW CHIT

WP # _____ (ENG-032)

CHIT # 8

COMPONENT/SUBSYSTEM/SYSTEM NCSX PF COIL PDR

COGNIZANT DESIGN ENGINEER KALISH DATE OF REVIEW 12/14/07

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SUBJECT: (CHECK AS APPLICABLE)

☐ REQUIREMENTS ☐ HARDWARE ☐ SAFETY
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☐ PERFORMANCE ☐ RELIABILITY/MAINTAINABILITY ☐ QUALITY

COMMENT/CONCERN/RECOMMENDATION

Need plan to measure coil copper temperature to prevent flow of LN₂ into warm coil. T/C's in copper not recommended. Consider fiber optic probe or resistance measurement
ORIGINATOR _____
NAME/ORGANIZATION (Neumyer)
Scheme.

REVIEW BOARD COMMENT/RECOMMENDATION

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

☒ CONCUR
☐ DISAGREE
☐ OTHER

CHAIRPERSON [Signature]

DATE: 12/14/07

COGNIZANT DESIGN ENGINEER'S RESPONSE/DISPOSITION

SIGNATURE _____ DATE: _____

RESPONSIBLE RLM REVIEW

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COGNIZANT DESIGN ENGINEER CLOSE-OUT

Sign when action required by disposition is complete.

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PPPL DESIGN REVIEW CHIT

WP # _____ (ENG-032)

CHIT # 9

COMPONENT/SUBSYSTEM/SYSTEM NCSX PF COIL PDR

COGNIZANT DESIGN ENGINEER KALISH DATE OF REVIEW 12/14/07

☐ PEER
☐ CDR
☒ PDR
☐ FDR

SUBJECT: (CHECK AS APPLICABLE)

☐ REQUIREMENTS
☐ ANALYSIS
☐ PERFORMANCE

☒ HARDWARE
☐ CONFIGURATION
☒ RELIABILITY/MAINTAINABILITY

☐ SAFETY
☐ COST/SCHEDULE
☐ QUALITY

COMMENT/CONCERN/RECOMMENDATION

WHO IS RESPONSIBLE FOR ~~THESE~~ COIL PROTECTION DUE TO THERMAL SHOCK?
WILL THIS BE COVERED AS ~~THE~~ PART OF WBS ~~5~~ (I&C) WITH INTERLOCKS TO THE CRYOGENIC SYSTEM?
ORIGINATOR STRYKOWSKY
NAME/ORGANIZATION

REVIEW BOARD COMMENT/RECOMMENDATION

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

See # 8

☐ CONCUR
☐ DISAGREE
☒ OTHER

CHAIRPERSON

DATE:

COGNIZANT DESIGN ENGINEER'S RESPONSE/DISPOSITION:

SIGNATURE _____

DATE: _____

RESPONSIBLE RLM REVIEW

☐ APPROVE COG DISPOSITION
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SIGNATURE _____

DATE: _____

COGNIZANT DESIGN ENGINEER CLOSE-OUT

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DATE: _____

PPPL DESIGN REVIEW CHIT

WP # _____ (ENG-032)

CHIT # 10

COMPONENT/SUBSYSTEM/SYSTEM NCSX PF COIL PDR

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☐ PERFORMANCE ☐ RELIABILITY/MAINTAINABILITY ☐ QUALITY

COMMENT/CONCERN/RECOMMENDATION

of thermal cycles considered for the design to be documented

ORIGINATOR [Signature]

NAME/ORGANIZATION

REVIEW BOARD COMMENT/RECOMMENDATION

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If not already given in (R1)

☒ CONCUR
☐ DISAGREE
☐ OTHER

CHAIRPERSON [Signature]

DATE: 12/14/07

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RESPONSIBLE RLM REVIEW

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PPPL DESIGN REVIEW CHIT

WP # _____ (ENG-032)

CHIT # 11

COMPONENT/SUBSYSTEM/SYSTEM NCSX PF COIL PDR

COGNIZANT DESIGN ENGINEER KALISH DATE OF REVIEW 12/14/07

☐ PEER
☐ CDR
☒ PDR
☐ FDR

SUBJECT: (CHECK AS APPLICABLE)

☐ REQUIREMENTS ☐ HARDWARE ☐ SAFETY
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☐ PERFORMANCE ☐ RELIABILITY/MAINTAINABILITY ☐ QUALITY

COMMENT/CONCERN/RECOMMENDATION

The Time ~~at~~ at Test Voltage should be 1 min to allow for charging current to level off and not influence the true leakage current.

ORIGINATOR Tom Mesghari
NAME/ORGANIZATION PPPL

REVIEW BOARD COMMENT/RECOMMENDATION

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☒ CONCUR
☐ DISAGREE
☐ OTHER

CHAIRPERSON [Signature]

DATE: 12/14/07

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SIGNATURE _____ DATE: _____

RESPONSIBLE RLM REVIEW

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☐ DISAPPROVE COG DISPOSITION

SIGNATURE _____ DATE: _____

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PPPL DESIGN REVIEW CHIT

WP # _____ (ENG-032)

CHIT # 12

COMPONENT/SUBSYSTEM/SYSTEM NCSX PF COIL PDR

COGNIZANT DESIGN ENGINEER KALISH DATE OF REVIEW 12/14/07

☐ PEER
☐ CDR
☒ PDR
☐ FDR

SUBJECT: (CHECK AS APPLICABLE)

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

COMMENT/CONCERN/RECOMMENDATION

Coil shape should be maintained with bracing from line of VPI until coils are installed in machine. This will minimize reshaping.
(PF-5 and PF-6 only)

ORIGINATOR J Chyomush

NAME/ORGANIZATION PPPL

REVIEW BOARD COMMENT/RECOMMENDATION

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☐ DISAGREE
☐ OTHER

CHAIRPERSON [Signature]

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SIGNATURE _____ DATE: _____

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PPPL DESIGN REVIEW CHIT

WP # _____ (ENG-032)

CHIT # 13

COMPONENT/SUBSYSTEM/SYSTEM NCSX PF COIL PDR

COGNIZANT DESIGN ENGINEER KALISH DATE OF REVIEW 12/14/07

- ☐ PEER
☐ CDR
☒ PDR
☐ FDR

SUBJECT: (CHECK AS APPLICABLE)

- | | | |
|---------------------------------------|--|--|
| <input type="checkbox"/> REQUIREMENTS | <input type="checkbox"/> HARDWARE | <input type="checkbox"/> SAFETY |
| <input type="checkbox"/> ANALYSIS | <input type="checkbox"/> CONFIGURATION | <input type="checkbox"/> COST/SCHEDULE |
| <input type="checkbox"/> PERFORMANCE | <input type="checkbox"/> RELIABILITY/MAINTAINABILITY | <input type="checkbox"/> QUALITY |

COMMENT/CONCERN/RECOMMENDATION

*special shipping instructions
are required*

ORIGINATOR [Signature]

NAME/ORGANIZATION

REVIEW BOARD COMMENT/RECOMMENDATION

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See # 12

- 0 CONCUR
0 DISAGREE
0 OTHER

CHAIRPERSON [Signature]

DATE: 12/14/07

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SIGNATURE _____ DATE: _____

RESPONSIBLE RLM REVIEW

- 0 APPROVE COG DISPOSITION
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