



Bruce L. Chrisman
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September 24, 2009

Dr. Joanna M. Livengood
Site Manager
Fermi Site Office
U.S. Department of Energy
P. O. Box 2000
Batavia, Illinois 60510

Dear Dr. Livengood:

SUBJECT: National Environmental Policy Act (NEPA) Environmental Evaluation Notification Form (EENF) for the 'Phase and Frequency Locked Magnetrons for SFR Sources'

Teri Dykhuis, of the Environment, Safety & Health Section, has concluded that a NEPA determination is needed for the above project. Please review the attached notification and let us know of your decision.

If you have any questions concerning this information, please contact Teri at X3607.

Sincerely,

Bruce L. Chrisman
Chief Operating Officer

Attachments: EENF (3 pages)

Cc w/o attachment:

M. Bollinger (DOE)
R. Dixon (AD)
T. Dykhuis
B. Fritz (AD)
N. Grossman (ESH)
S. Holmes

Y.-K. Kim
M. Michels
P. Oddone
M. Popovic (AD)
J. Scott (DOE)

RECEIVED

SEP 28 2009

Environment,
Safety & Health Section

ES&H File: EEs



Department of Energy

Fermi Site Office
Post Office Box 2000
Batavia, Illinois 60510

SEP 25 2009

Dr. Bruce Chrisman
Chief Operations Officer
Fermilab
P.O. Box 500
Batavia, IL 60510

Dear Dr. Chrisman:

SUBJECT: NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) APPROVAL FOR THE
"PHASE AND FREQUENCY LOCKED MAGNETRONS FOR
SUPERCONDUCTING RADIO FREQUENCY (SFR) SOURCES,"
CRADA FRA-2009-002

Reference: Letter, B. Chrisman to J. Livengood, dated September 24, 2009, Subject:
National Environmental Policy Act Environmental Evaluation Notification Form
(EENF) the Phase and Frequency Locked Magnetrons for SFR Sources

I have reviewed the Fermilab Environmental Evaluation Notification Form (EENF) for the subject proposed project transmitted by your referenced letter. Based on the information provided in the EENF, I have approved the following project as a categorical exclusion (CX):

<u>Project Name</u>	<u>Approved</u>	<u>CX(s)</u>
Phase and Frequency Locked Magnetrons for SFR Sources CRADA FRA-2009-002	9/25/2009	B3.6

I am returning a signed copy of the EENF for your records. No further NEPA review is required. This project falls under a categorical exclusion(s) provided in 10 CFR 1021, as amended in November 1997.

Sincerely,

Dr. Joanna M. Livengood
Site Manager

Enclosure:
As Stated

cc: P. Oddone, w/o encl.
Y.-K. Kim, w/o encl.
N. Grossman, w/o encl.

FERMILAB ENVIRONMENTAL EVALUATION NOTIFICATION FORM

Project/Activity Title: Phase and Frequency Locked Magnetrons for Superconducting Radio Frequency (SRF) Sources

ES&H Tracking Number: 01080 01079

Funding Source: Cooperative Research and Development Agreement (CRADA) w/ Muons Inc.

Fermilab Environmental Officer (submitter of NEPA PIF): Barry Fritz (X2230)

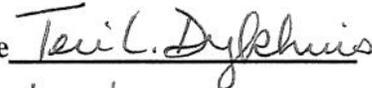
Fermilab Project Manager: Milorad Popovic (X4478)

I hereby certify via my signature that every effort would be made throughout this project to comply with the commitments made in this document and to pursue cost-effective pollution prevention opportunities. Pollution prevention (source reduction and other practices that eliminate or reduce the creation of pollutants) is recognized as a good business practice which would enhance site operations thereby enabling the Lab to accomplish its mission, achieve environmental compliance, reduce risks to health and the environment, and prevent or minimize future DOE legacy wastes.

Signature 

Date Sep 23 - 2009

Fermilab NEPA Reviewer: Teri L. Dykhuis

Signature 

Date 9/23/09

I. Description of the Proposed Action and Need

The purpose of the proposed project is to develop highly efficient and inexpensive magnetrons to provide the lowest-cost microwave sources for a number of diverse applications, including particle accelerators, phased-array radars, and sputtering systems. The goal would be to develop novel variable frequency cavity techniques that would be utilized to phase and frequency lock magnetrons, allowing their use for either individual cavities or cavity strings. Such techniques may be needed at Fermilab in a future construction project such as a Muon Collider, Neutrino Factory, or intensity frontier beam facility.

The project involves analysis and cold RF testing of magnetron anodes with various ferrite materials on a network analyzer. These tests do not use high voltage and do not include hazardous materials of any kind. Activities may include assembly of a magnetron with magnetic fields using DC solenoids, in which case all applicable electrical safety regulations would be followed. The initial activity would be analytical studies to determine the size of and where to

place ferrite/yttrium-iron-garnet (YIG) rods in an existing magnetron to achieve the desired magnetic properties. The next step would be to fabricate a ferrite-loaded, radial-vaned, π -mode structure or modify an existing one, and design a feedback loop to control phase and frequency. Cold test circuits for verification of the models would be assembled. Once the magnetron, which is similar to a microwave oven, was constructed, it would undergo mechanical strength testing and testing of its microwave characteristics. Fabrication and mechanical strength testing of the assemblies would occur off site. Only the latter tests would take place at Fermilab--in the Linac "south mezzanine," room LIG-108.

There are no reasonable technical alternatives that would fulfill the purpose and need for the project.

II. Description of the Affected Environment

This activity does not involve any civil construction, only fabrication and testing of a small experimental apparatus. The only potential environmental impact would be the disposition of experimental apparatus and materials upon completion of the research.

III. Potential Environmental Effects (Provide comments for each checked item and where clarification is necessary.)

A. Sensitive Resources: Would the proposed action result in changes and/or disturbances to any of the following resources?

- Threatened or endangered species
- Other protected species
- Wetland/Floodplains
- Archaeological or historical resources
- Non-attainment areas

B. Regulated Substances/Activities: Would the proposed action involve any of the following regulated substances or activities?

- Clearing or Excavation
- Demolition or decommissioning
- Asbestos removal
- PCBs
- Chemical use or storage
- Pesticides
- Air emissions
- Liquid effluents
- Underground storage tanks
- Hazardous or other regulated waste (including radioactive or mixed)
- Radioactive exposures or radioactive emissions
- Radioactivation of soil or groundwater

C. Other relevant Disclosures

- Threatened violation of ES&H permit requirements
- Siting/construction/major modification of waste recovery or TSD facilities
- Disturbance of pre-existing contamination
- New or modified permits
- Public controversy
- Action/involvement of another federal agency
- Public utilities/services
- Depletion of a non-renewable resource

IV. NEPA Recommendation

Fermilab has reviewed this proposed action and conclude that the appropriate level of NEPA determination is a Categorical Exclusion. The conclusion is based on the proposed action meeting the applicable requirements in DOE's NEPA Implementation Procedures, 10 CFR 1021, Subpart D, Appendix B3.6.

V. DOE/CH-FAO NEPA Coordinator Review

Concurrence with the recommendation for determination:

NEPA Coordinator Reviewer Sally Arnold

Signature _____

Date _____

Fermi Site Office Manager Dr. Joanna M. Livengood

Signature _____

Date _____

VI. Comments on checked items in section III.

There are no checked items.

Additional Information

After completion of the research, all experimental apparatus and materials would be reused, recycled or disposed of appropriately and according to all applicable requirements.

