PIP-II Preliminary Design Review Charge for Building Infrastructure Electrical Systems (Cables and Racks)

Document number: ED0012524

Document Approval

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Revision History

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| --- | --- | --- | --- |
| Revision | Date Release | Originator:  Role: | Description of Change |
| 0 | 8/18/20 | Jonathan Hunt (Review Coordinator) | Initial Release |
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# Introduction

The Building Infrastructure Electrical Systems (Cables and Racks) Preliminary Design Review (PDR) is an independent evaluation of the preliminary design of the following aspects of the PIP-II electrical systems infrastructure for the Linac Complex:

* AC Power distribution downstream of the disconnect switches;
* Cable database;
* Standard cables and connectors;
* Routing of cables, cable trays, and penetrations; and,
* Standard racks.

The review committee is requested to assess if the electrical systems design is at the preliminary level (~30-50% maturity), if the engineering approaches and methodologies are suitable to meet project requirements, and if lessons learned from other projects have been incorporated into the design. A final written report from the Review Committee listing including the findings, comments, and recommendations from this review is requested within seven (7) days of completion of the Review.

# Review Agenda

| PDR for the Building Infrastructure Electrical Systems (Cables and Racks) Agenda |
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| --- | --- |
| Location: | Zoom Meeting – see meeting invitation for Meeting ID and connection information |
| Date: | Monday 8/31/2020 |
| Time:  Indico Site: | 8:30 am (CDT)  <https://indico.fnal.gov/event/44573/> |

Participants:

|  |  |  |
| --- | --- | --- |
| Jonathan Hunt  [huntjw@fnal.gov](mailto:huntjw@fnal.gov) | Fermilab | Role: Coordinator |
| Ryan Crawford  [rcrawfor@fnal.gov](mailto:rcrawfor@fnal.gov) | Fermilab | Role: Presenter |
| Chris Jensen  [ccjensen@fnal.gov](mailto:ccjensen@fnal.gov) | Fermilab | Role: Review Chair |
| Matt Boyes  [mboyes@slac.stanford.edu](mailto:mboyes@slac.stanford.edu) | SLAC | Role: Reviewer |
| Steve Hays  [slh@fnal.gov](mailto:slh@fnal.gov) | Fermilab | Role: Reviewer |
| Michele Mccusker-Whiting  [mccusker@fnal.gov](mailto:mccusker@fnal.gov) | Fermilab | Role: Participant |

Agenda details:

## Introduction (10 min)

### Welcome & Logistics: Jonathan Hunt

### PIP-II Review guidance: Alex Martinez

## Overview of Building Infrastructure L4 Electrical Systems (30 min): Jonathan Hunt

### Overview of Electrical Systems L4

### Schedule

## AC Power Distribution (30 min): Ryan Crawford

### System Requirements

### Infrastructure

### Safety

### Lessons Learned

## Cables and Racks (60 min): Ryan Crawford

### Standard Cables and Connectors

### Cable Routing and Penetrations

### Cable Trays

### Standard Racks

### Cable Database Setup and Features

### Lessons Learned

### Quality Control

### Risks

## Questions/Discussion (60 min): All

### General discussion and questions from committee

### Any other information committee needs to develop report

## Closeout (10 min) – Review Chair (Chris Jensen)

### Summary Statement

### Preliminary Findings

### Preliminary Comments

### Preliminary Recommendations

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# Review Charge Statement

The Building Infrastructure Electrical Systems (Cables and Racks) PDR is an independent evaluation of the AC power distribution infrastructure downstream of the disconnect switches, standard cables and connectors, routing of cables (including cable trays and penetrations), and standard racks. This review will pertain to the PIP-II Linac Complex.

The review committee is requested to assess/answer the following questions:

* Is the Linac Complex electrical system designs and its associated documentation at the preliminary design level (~30-50%)?
* Are the engineering approaches and methodologies presented herein suitable to meet project requirements?
* Have lessons learned from other projects been incorporated into the design?

The committee is requested to provide a final written report within 7 days of this review that addresses the specific charge questions, along with a list of any findings, comments, and recommendations to be applied to the final design phase of this project.

All documents will be available for review by the committee approximately one week prior to the review date. Files will be uploaded to the Indico site listed above.

# Acronyms

List and define any relevant acronyms as necessary.

|  |  |
| --- | --- |
| AC | Alternating Current |
| PDR | Preliminary Design Review |
| QC | Quality Control |

# Reference Documents

List any relevant documents referred to in the Review Charge Statement. Include reference links or locations where the references are found. This list should include all documents with which the review committee should be familiar prior to the review.

|  |  |
| --- | --- |
| 1 | PIP-II Technical Review Plan – TC ED0008163 |
| 2 | PIP-II Quality Assurance Plan DocDB # [142](https://pip2-docdb.fnal.gov/cgi-bin/private/ShowDocument?docid=142) |
| 3 | PIP-II Systems Engineering Management Plan – TC ED0008164 |
| 4 | PIP-II IESH Management Plan DocDB # [141](https://pip2-docdb.fnal.gov/cgi-bin/private/ShowDocument?docid=141) |
| 5 | 121.02 SRF and Cryo Systems Design Plan DocDB # [2605](https://pip2-docdb.fnal.gov/cgi-bin/private/ShowDocument?docid=2605) |
| 6 | 121.03 Accelerator Systems Design Plan DocDB # [2599](https://pip2-docdb.fnal.gov/cgi-bin/private/ShowDocument?docid=2599) |
| 7 | 121.04 Linac Installation and Commissioning Design Plan DocDB # [2581](https://pip2-docdb.fnal.gov/cgi-bin/private/ShowDocument?docid=2581) |
| 8 | 121.05 Accelerator Complex Upgrades Design Plan DocDB # [2593](https://pip2-docdb.fnal.gov/cgi-bin/private/ShowDocument?docid=2593) |
| 9 | 121.06 Conventional Facilities Design Plan DocDB # [2587](https://pip2-docdb.fnal.gov/cgi-bin/private/ShowDocument?docid=2587) |
| 10 | PIP-II Value Engineering Plan DocDB # [2830](https://pip2-docdb.fnal.gov/cgi-bin/private/ShowDocument?docid=2830) |

Table 1 – Document Deliverables for this review from the System Design Plan

|  |  |  |  |
| --- | --- | --- | --- |
|  | Document Title | Status  (preliminary, final, released) | Comments |
| 1 | FRS – Building Infrastructure | Released |  |
| 2 | Room Data Sheet | Released |  |
| 3 | Master ICD | Released |  |
| 4 | Risk Assessment Document for Electrical System | Preliminary | Completed |
| 5 | Updated Prevention through Design Tables | Preliminary | Completed |
| 6 | Updated Resource Loaded Schedule | Released |  |
| 7 | Cable List (scaling cables) | Preliminary | Completed |
| 8 | Cable Tray, Cable Routing, and Rack Layout Design | Preliminary | Completed |
| 9 | Cable Plant Pull and Documentation Plan | Preliminary | Completed |
| 10 | Cable Criteria Document | Preliminary | Completed |
| 11 | Standard Cable and Connector List | Preliminary | Completed |
| 12 | L3 QC Plan | Preliminary | In-progress |