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LBNF Target Remote Handling

LBNF Target CDR

2019/08/21



Overview

- Targets are a disposable item and require removal and replacement (design lifetime = 1 year).
- Identify equipment and procedures required to remove failed targetry components and replace them with new ones
- Investigate feasibility as well as impacts on work cell design





Starting Point – T2K



Similar concept, but several differences – longer target, horn clearances, lessons learnt etc. \rightarrow preliminary design



Work Cell Overview



High Power

Procedure Steps

- 1. Exchanger: storage \rightarrow work cell
- 2. Horn: chase \rightarrow work cell
- 3. Dock/align exchanger to horn
- 4. Attach exchange tooling to spent target
- 5. Undo service/diagnostic connections (He connectors/Hylen device)
- 6. Unbolt failed target from horn
- 7. Retract

High

Targets

- 8. Installation of new target is essentially reverse procedure
- 9. Disposal procedures are yet to be fixed Full exchange procedure is documented and conceptually modelled in CAD and will be developed into a preliminary design





Work Cell Considerations

- Manipulators
 - There are several commercially available manipulators that meet the requirements (reach/load) for LBNF target exchange procedures
- Infrastructure
 - No obvious show-stoppers
 - Several parameters can be optimised to maximise functionality of work cell: Lead glass window placement, manipulator install height etc.
- Change-out time

High Pow

Targets

 Target handling operations (excluding chase shielding block removals etc.) are envisage to take of the order 1 week for target replacement







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Summary

• Procedure for target exchange is now quite well defined

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- No show-stoppers have been identified in the work cell design impacts
- Target exchange procedures should take of the order 1 week, and fit within planned maintenance periods

