

Chopper system interfaces

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ESS CONTSTRAINTS

Environment
Operational
Project

Installation environment constraints

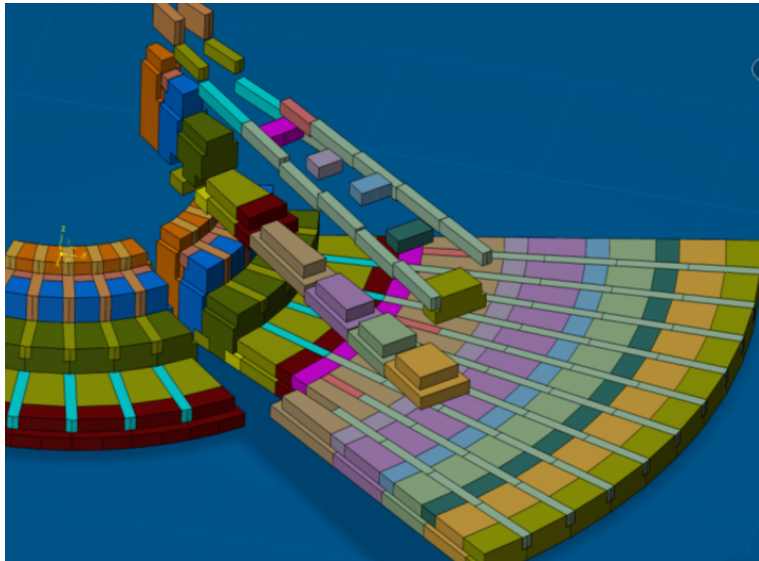
ESS Chopper Pit



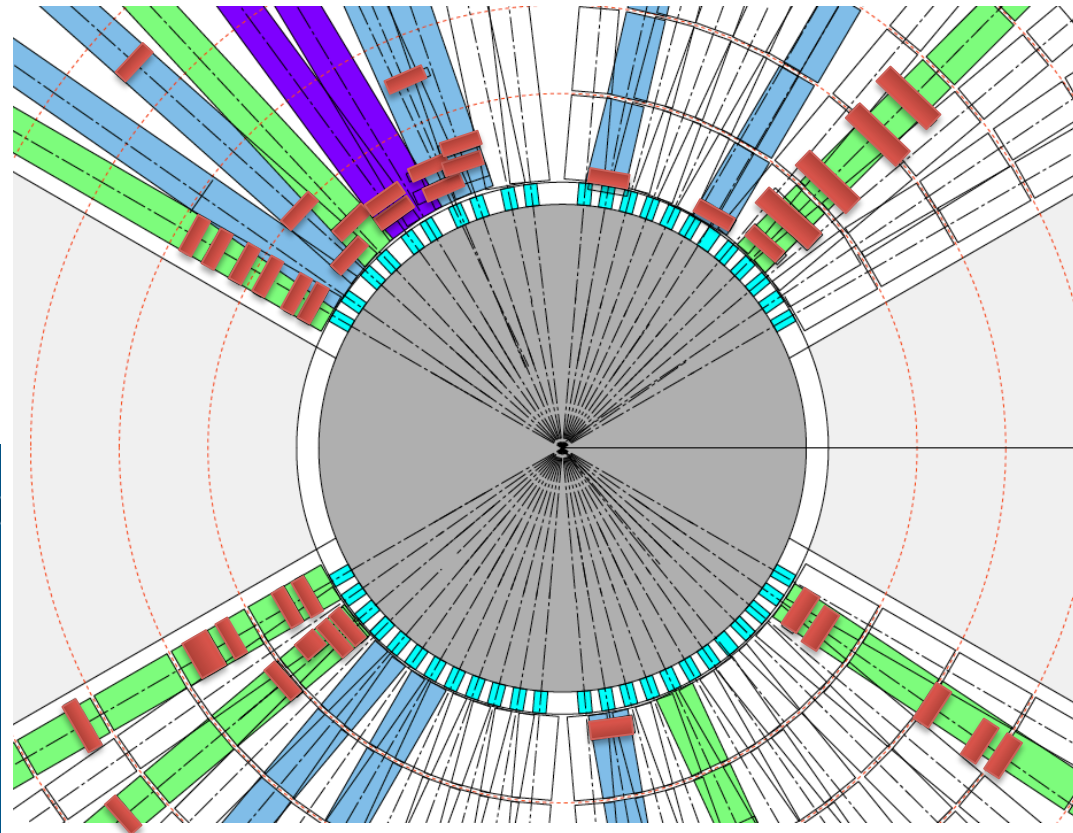
Not far from the truth

Installation environment constraints

- Up to four meter deep pits
- Only vertical access
- No personnel access after installation
- Areas with high level of cross instrument integration



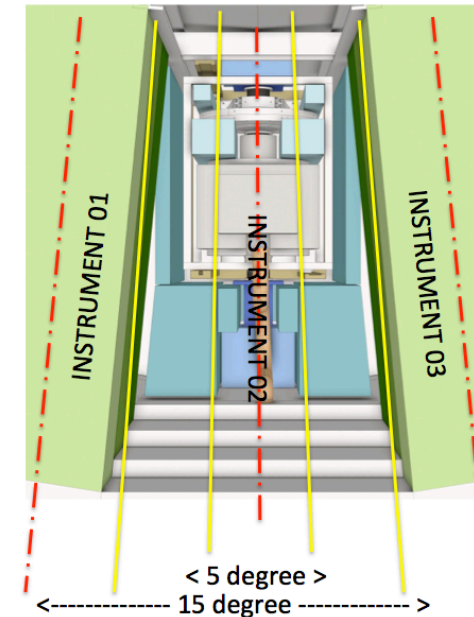
*Early bunker concept



*Chopper positions based on latest proposals

Operational constraints

- Aggressive schedule
- High levels of radiations
- No heavy shutters in monolith



Dec 2024	Jan 2025	Feb 2025	Mar 2025	Apr 2025	May 2025	Jun 2025	Jul 2025	Aug 2025	Sep 2025	Oct 2025	Nov 2025	Dec 2025
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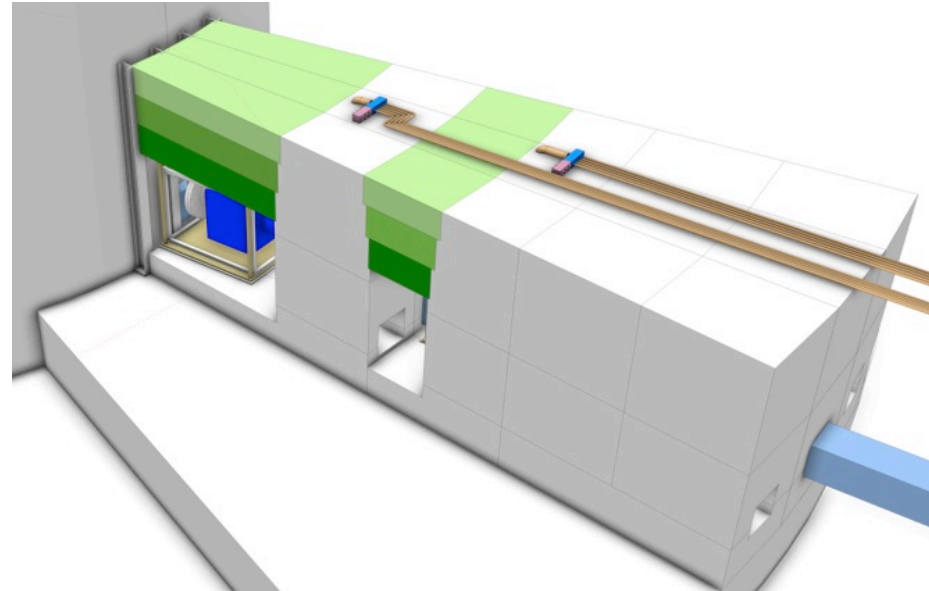
Project constraints

- In-kind environment
 - 17 countries
- Cost capped construction budget
 - 1.843 B€
- Cost capped operation budget
 - 140 M€ per year
- First neutrons by 2019



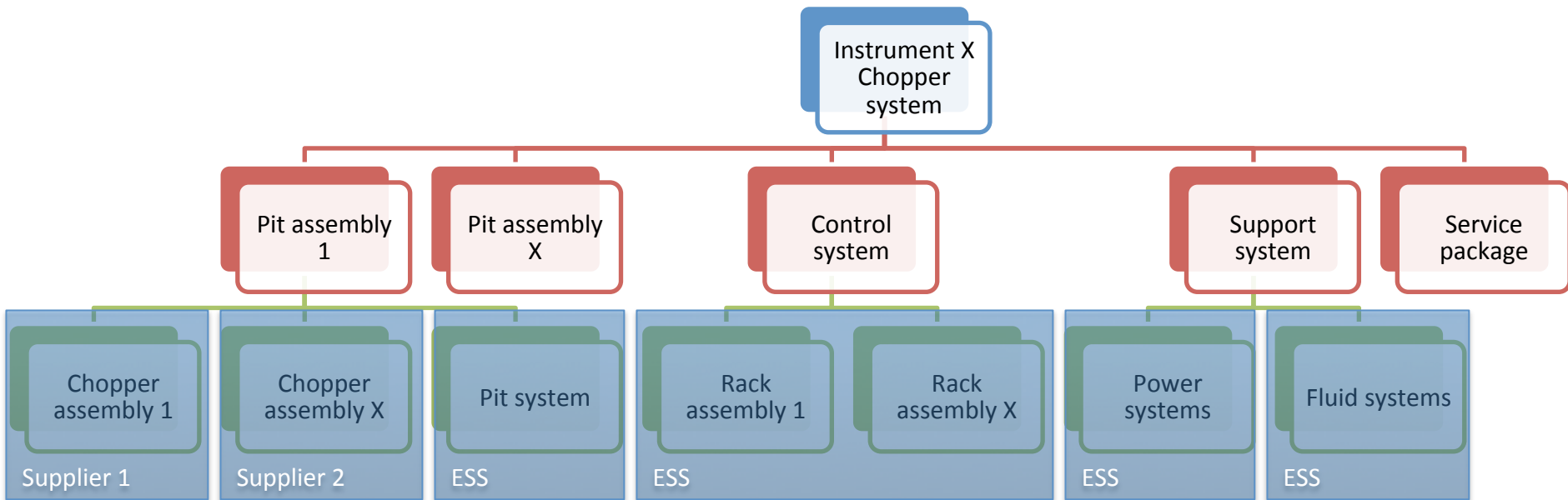
Constraint driven requirements

- High to very high reliability equipment
- Solutions dependent on accessibility
- Vertical extraction only
- High level of standardisation
- Cost driven procurement and operation

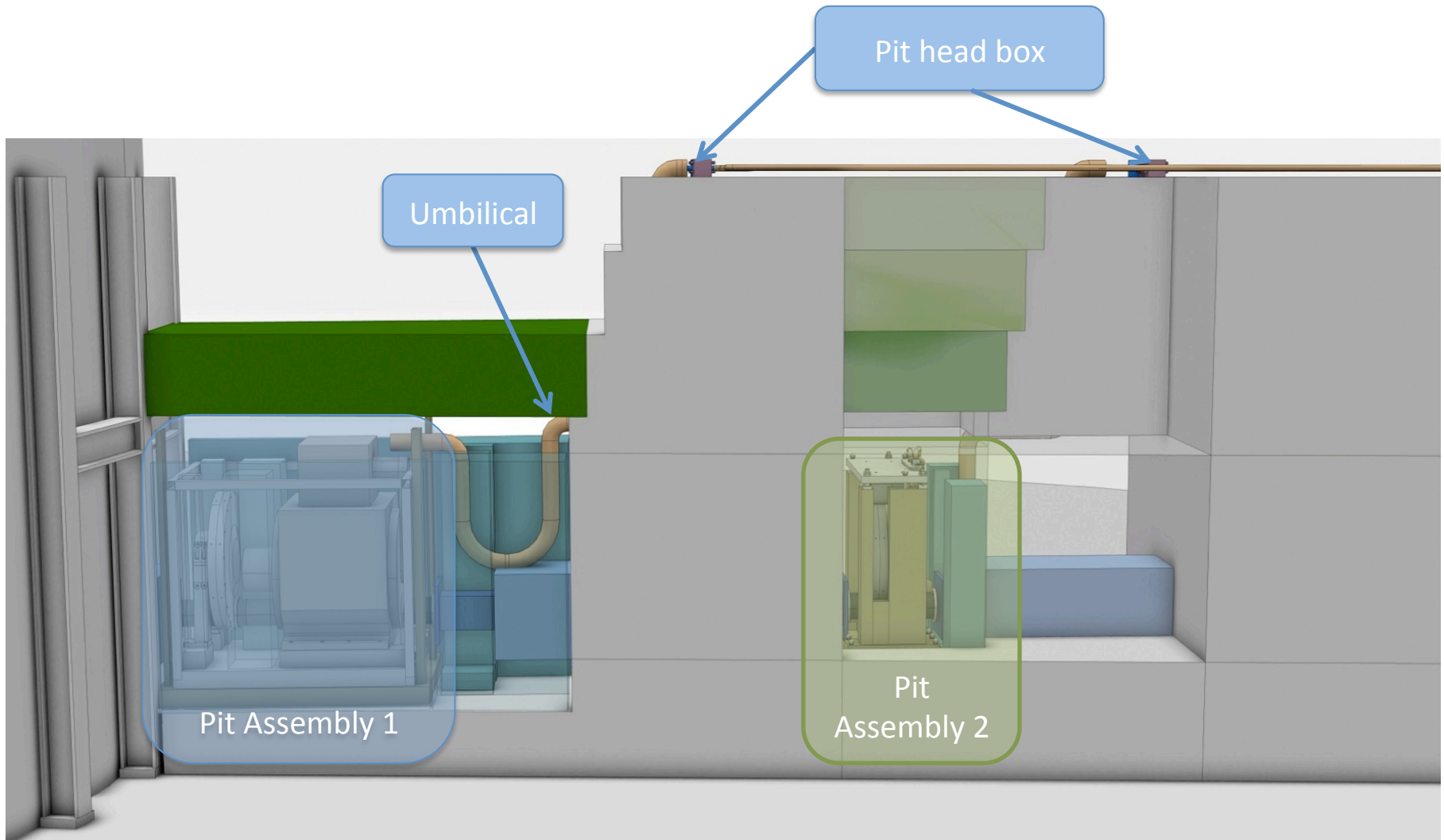


CHOPPER PBS INTRODUCTION

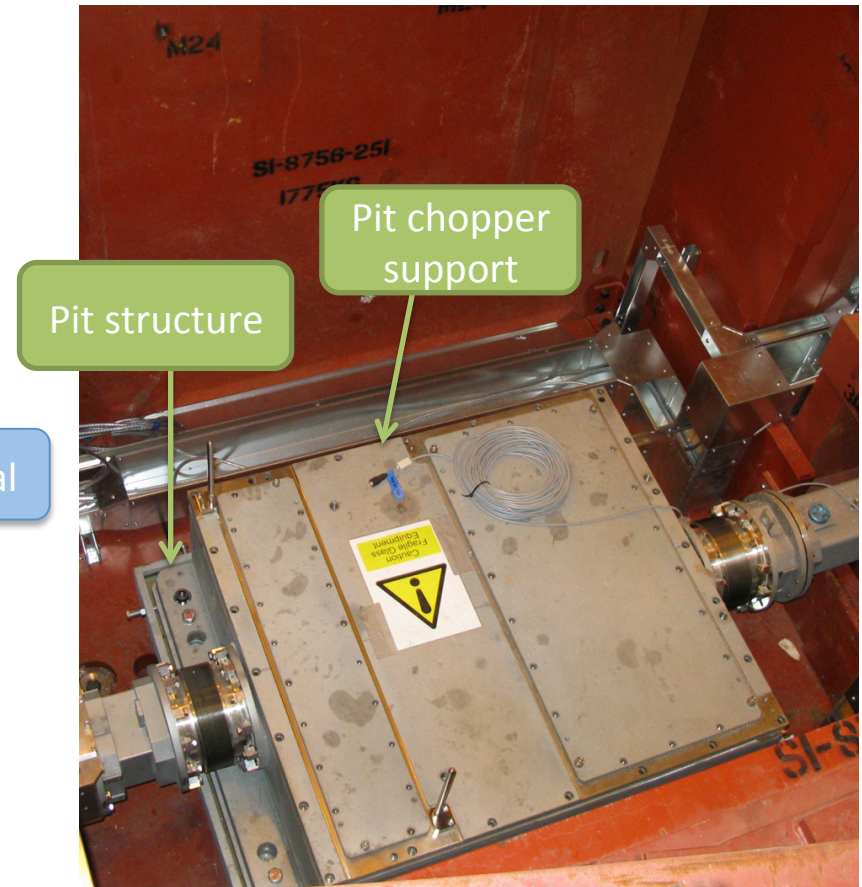
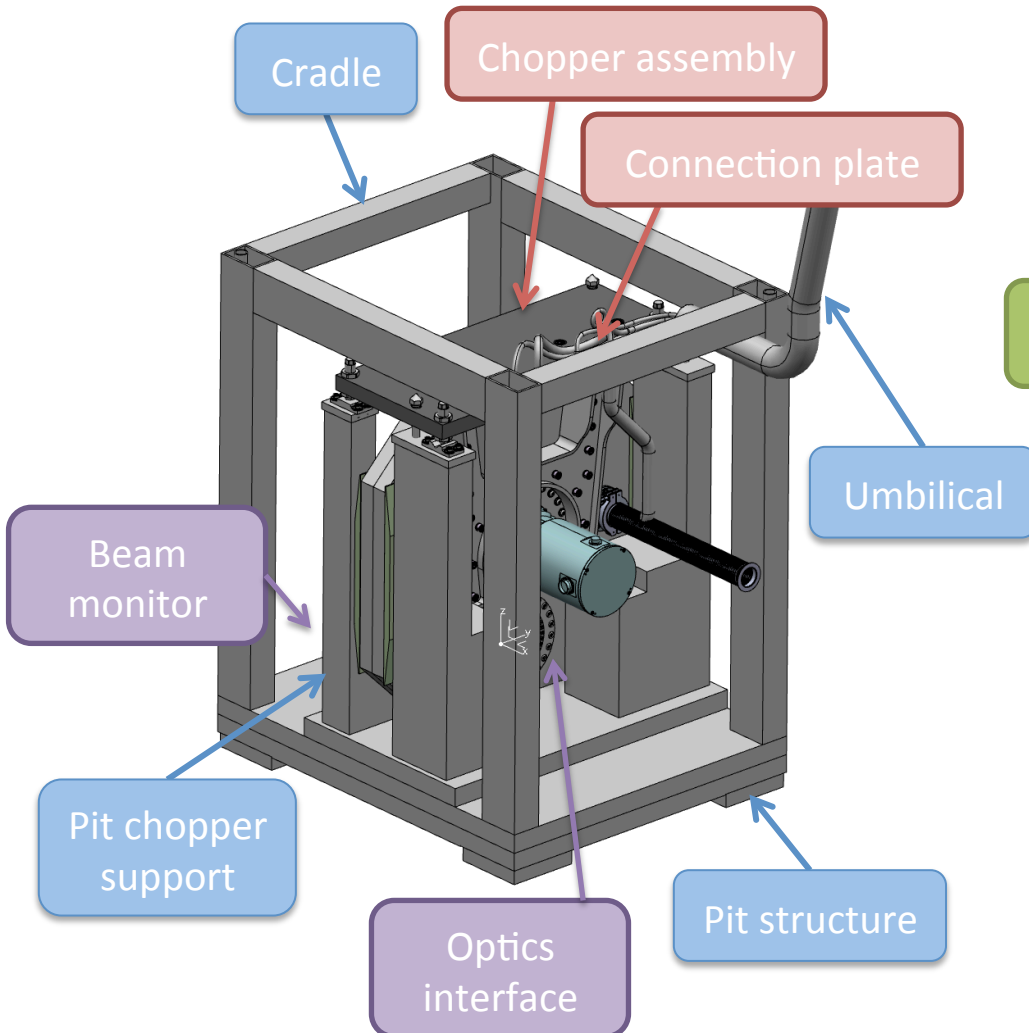
Chopper system PBS



Pit system example



Pit system example

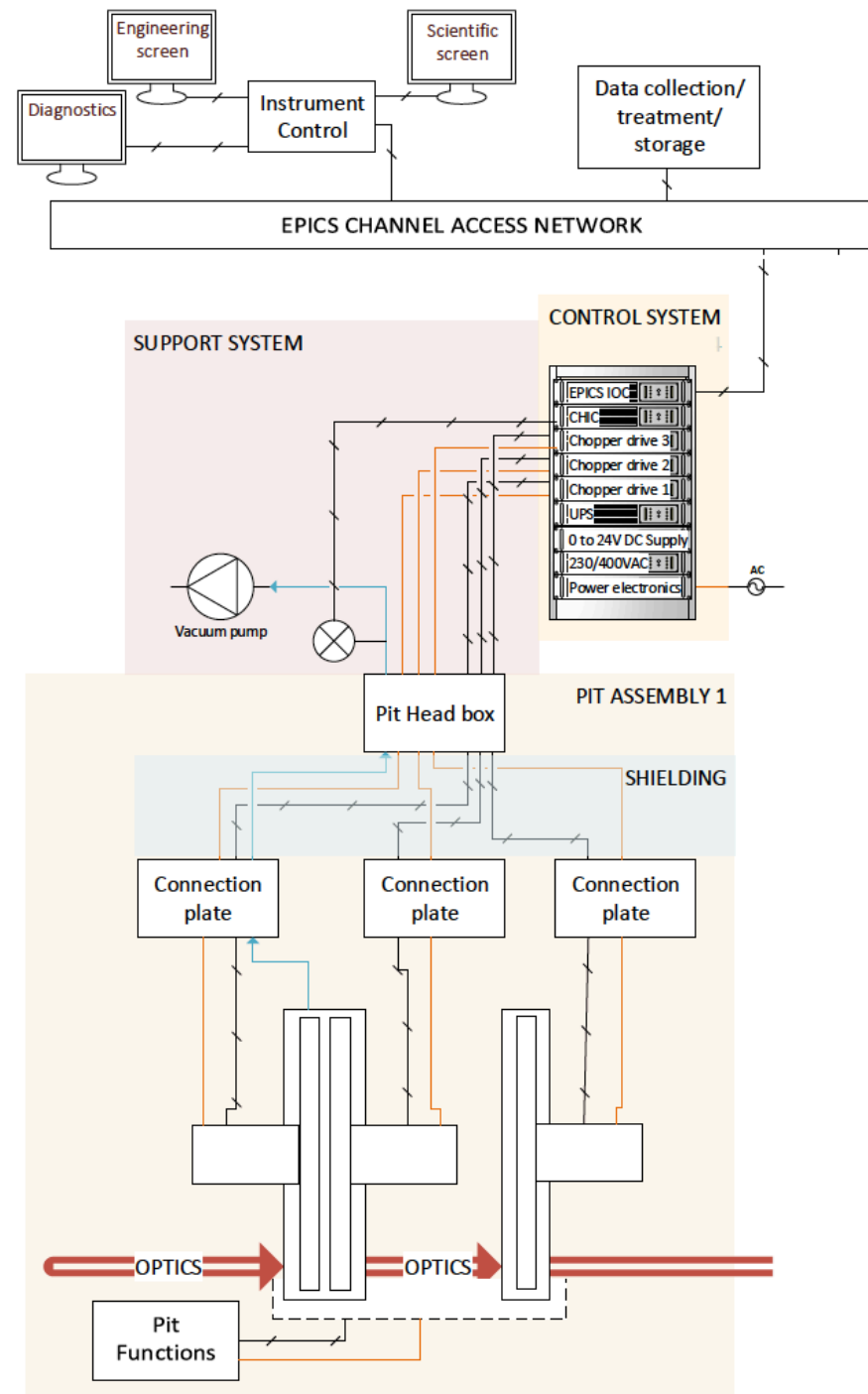


*ISIS IMAT example

INTERFACES

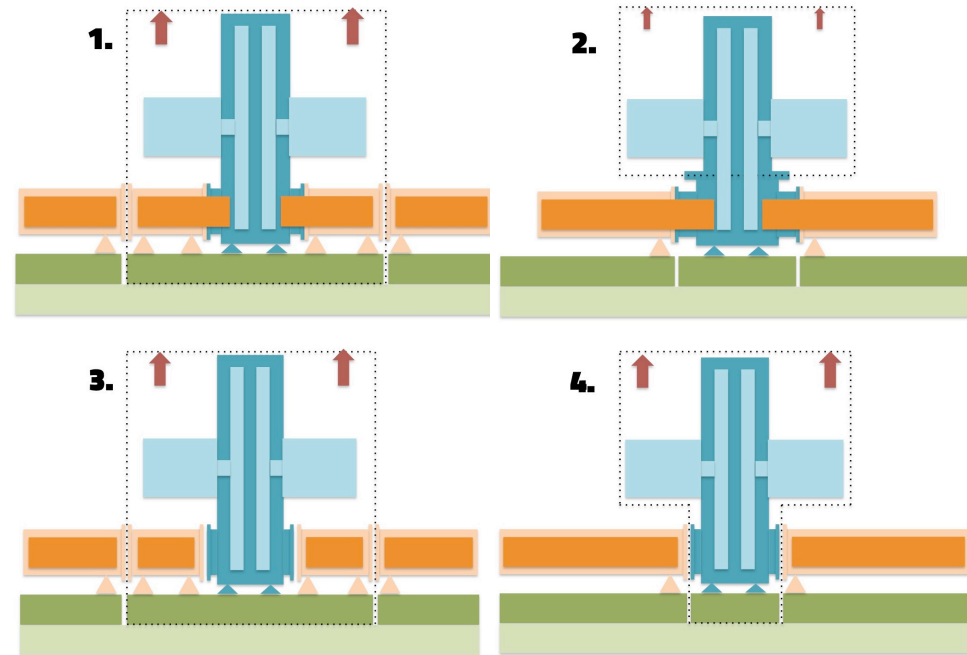
Chopper system interfaces

- Interfaces with many systems
 - Guide
 - Shielding
 - Cooling
 - Vacuum
 - Power
 - Integrated control system
 - Instrument
 - Safety
- Interfaces to chopper assembly goes through pit system



Pit installation variants

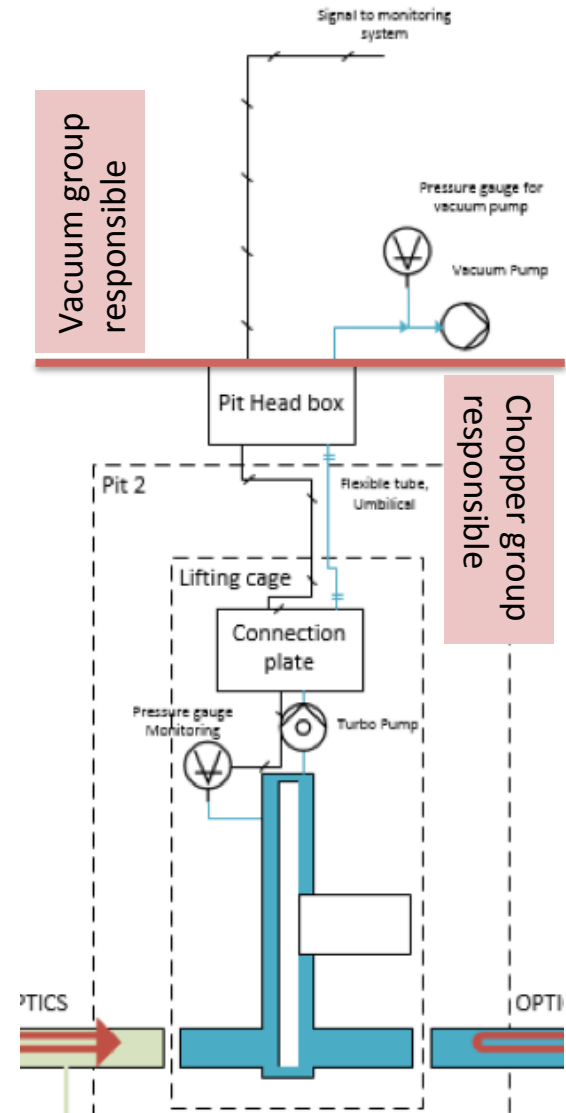
- Access and installation zones are being classified
- Dependent on access levels and environment harshness
- Different installation variants are being foreseen and evaluated
- Some installation variants will not be allowed in some zones



Common solutions and interfaces will be applicable for different variants!

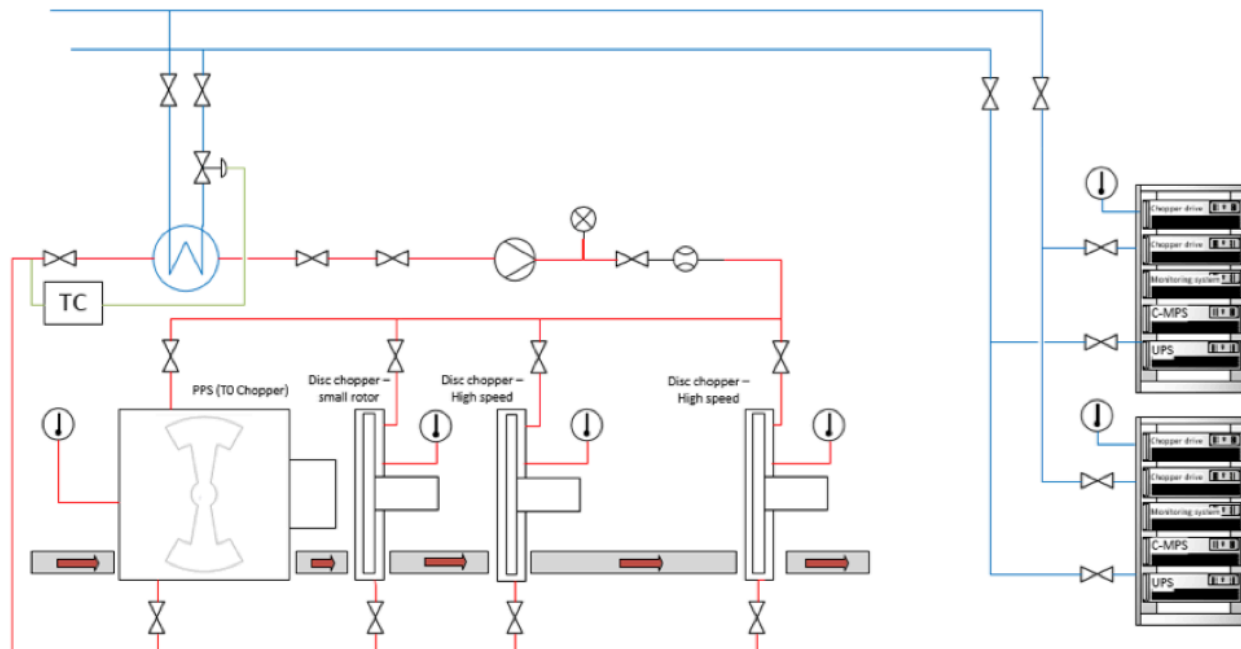
Vacuum

- Pumps, utilities and control is handled by the vacuum group
- In-pit routing is handled by the chopper group
- Equipment selection and guidance the vacuum group
- Different instruments have different vacuum solutions
- Interface at pit head box gives choppers a single interface point



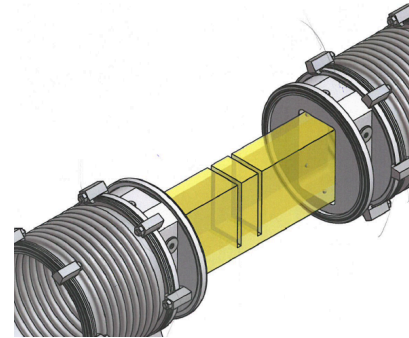
Cooling

- Instrument wide cooling loop for normal conditions
- Separate secondary loop for potentially activated circuits
- Interface point is planned to be in pit head box

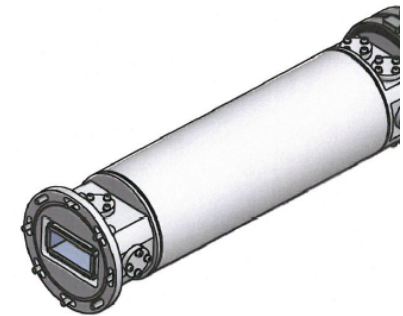


Optics

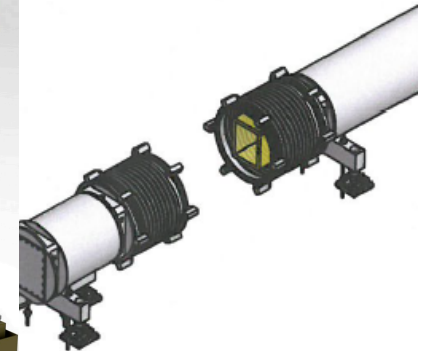
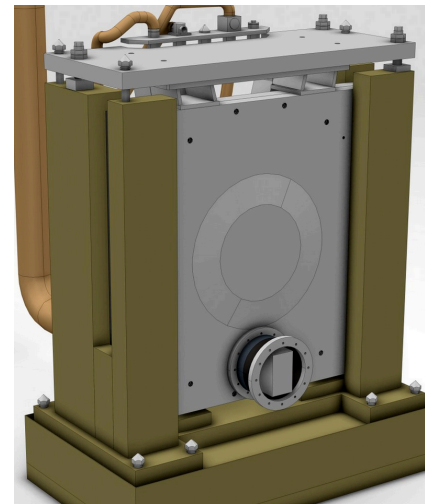
- Different installation variants effect optics interface
- Standard CF flange in three different sizes
- Interface on baseplate to optics support



*Courtesy of SNAG



*Courtesy of SNAG



*Courtesy of SNAG

Integrated controls system

