



DEMACO

It's all about Cryogenius!

Cryogenic Engineering for Superconducting Magnets at DEMACO

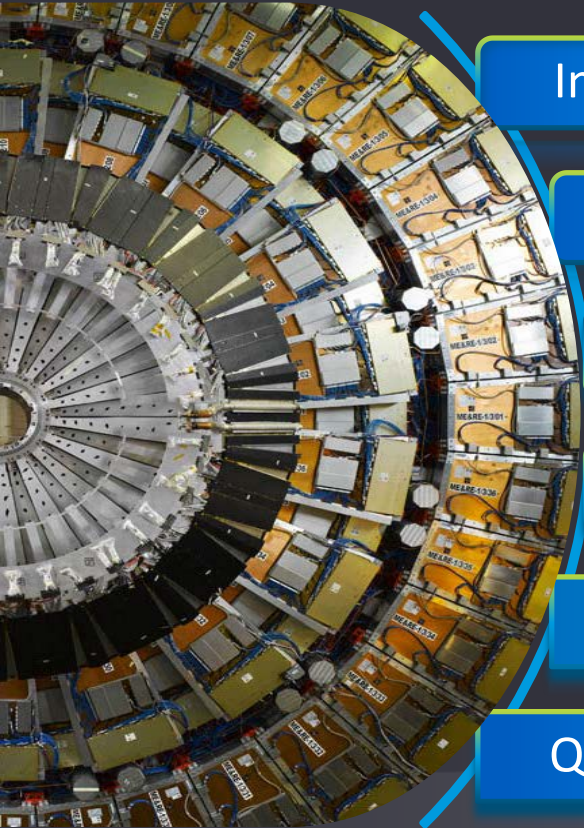
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MT25

25th International Conference
on Magnet Technology

RAI - Amsterdam
August 27 - September 1, 2017





Introduction

Cryogenic infrastructure

Cryogenics from research to industry

Cryogenic project phases

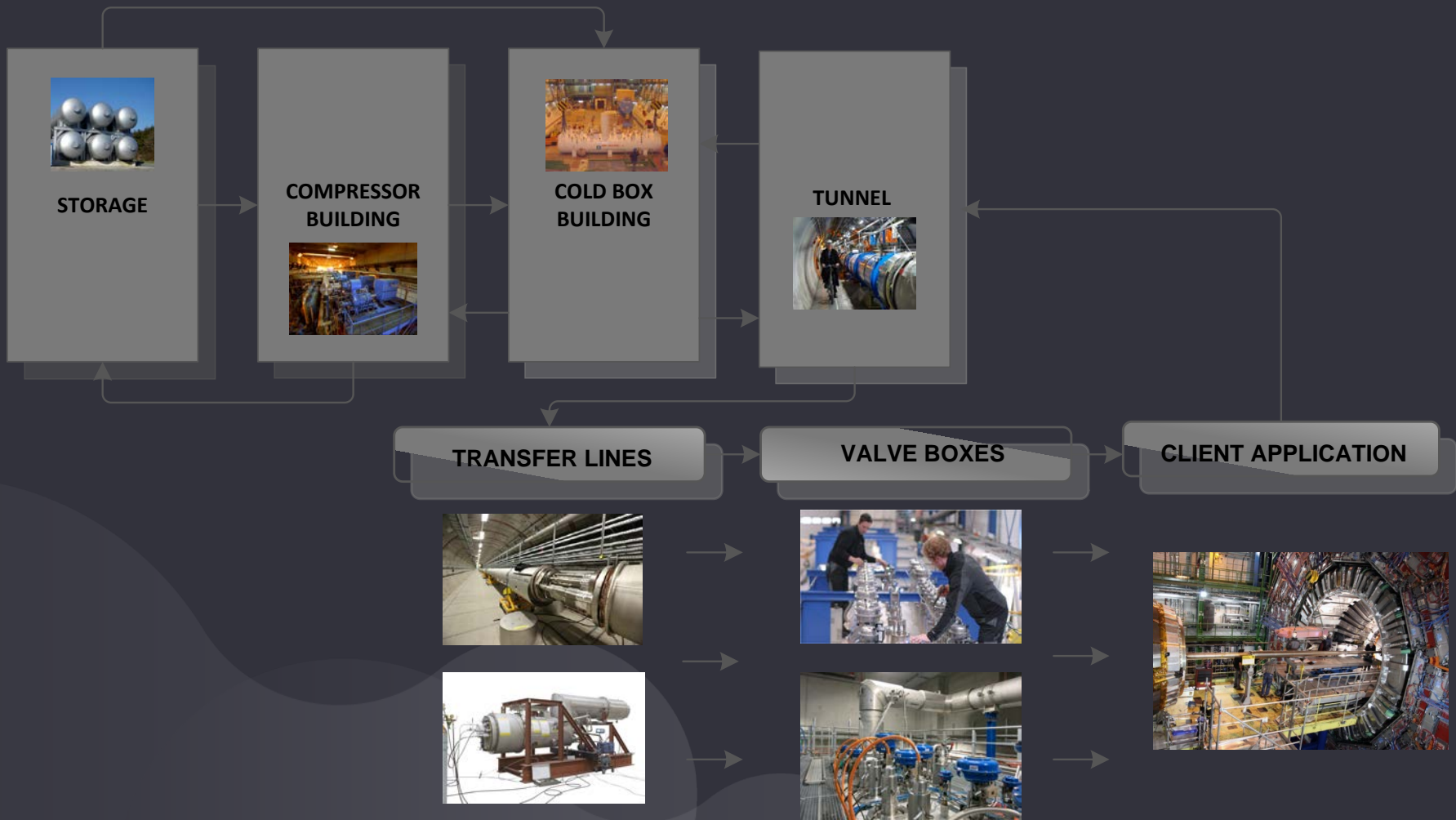
Cryo project examples

Questions

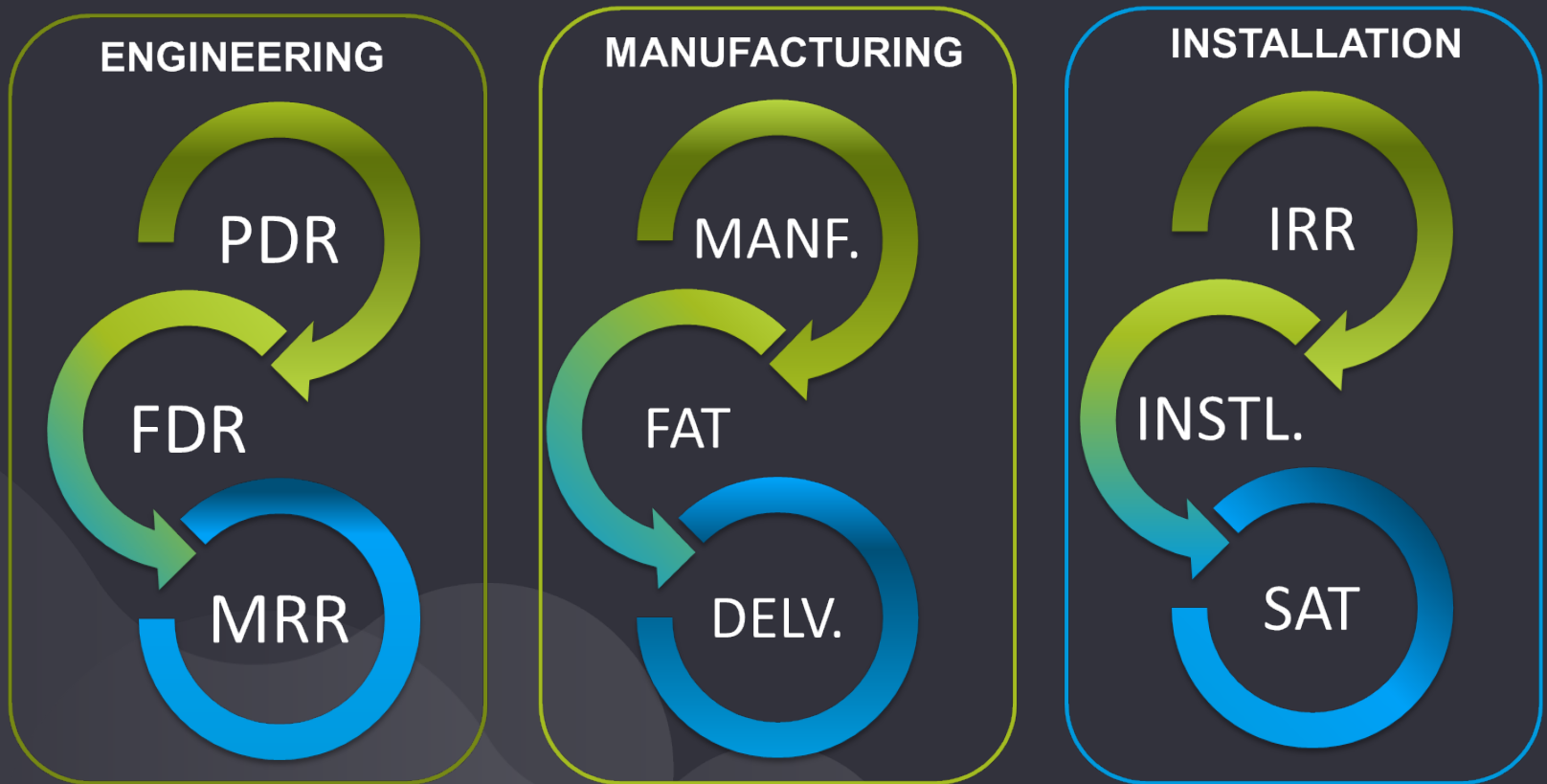
Cryogenics and accelerators around the world ...



Cryogenic Infrastructure...



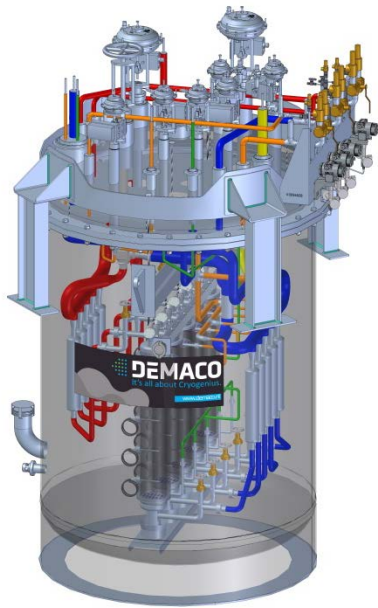
Cryogenics project from research to industry ...



Project Phase – Engineering

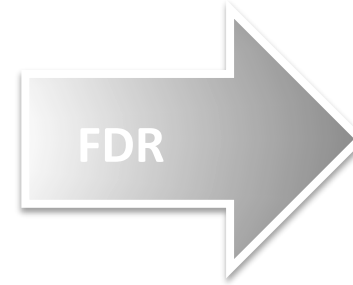
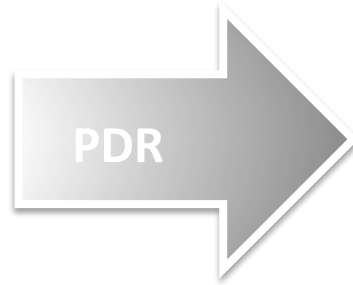
INPUT

- Technical Specification
- P&IDs
- Management Specifications
- Drawings



- Project Management Plan
- Quality Assurance Plan
- Preliminary:
 - Models
 - Structural analysis
 - Seismic analysis
 - Heat leak analysis
 - Cryogenic valves
 - Instruments

OUTPUT

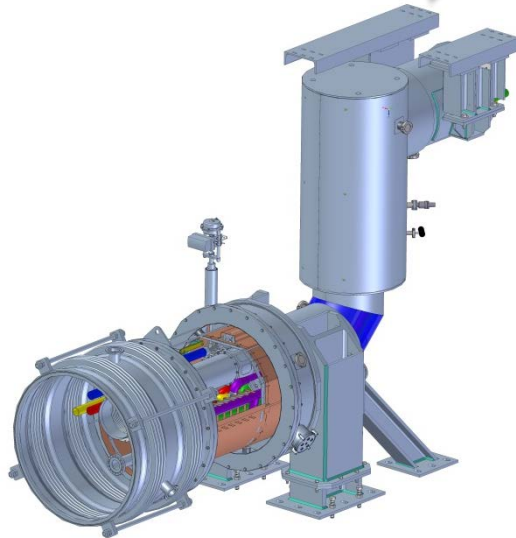
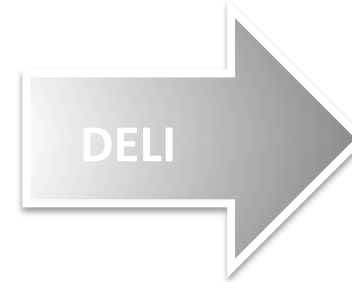
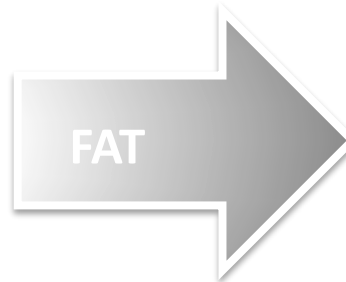


- Final:
 - Models
 - Structural analysis
 - Seismic analysis
 - Heat leak analysis
 - Cryogenic valves
 - Instruments
- WPS documents
- WPQ documents
- PQR documents
- Procedures:
 - Leak check
 - Pressure test
 - Inspection and examination

Project Phase – Manufacturing

INPUT

OUTPUT



- Dimensional check
- NDE
- Vacuum retention test
- Pressure test
- Helium leak test
- Cold shock test
- Valve/actuator test
- Instrumentation test
- Material test reports
- Instruments calibration data
- Final report:
 - Pressure test
 - Leak test
 - Calibration
- Compliance certificates

Project Phase – Installation

INPUT

OUTPUT

IRR

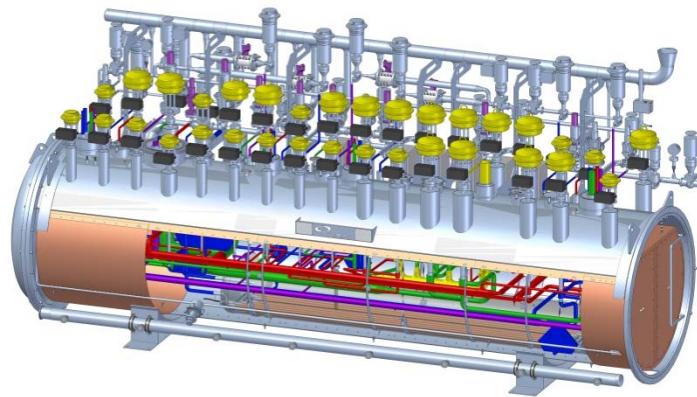
INSTL.

SAT

- Quality Plan
- ITP documents
- Installation procedures
- Installation drawings
- Assembly procedure
- Test procedures
- Manufacturer instructions

- Progress reports
- Individual qualifications

- Manufacturing Dossier including:
 - Acceptance certificates
 - Quality plan and ITPs
 - Welding documentation
 - NDT documentation
 - Test reports
 - As built drawings
 - Installation, operation and maintenance documentation



Cryogenic Projects ...



INPUT

OUTPUT

Cryogenics of European XFEL
Accelerator Module Test
Facility



Cryogenics of European XFEL
Feed Caps/End Caps/
Transfer Lines



LCLS II SLAC Feed Caps/
Transfer Lines



LHe

LHe

Installed Feed Cap for LHe at XFEL accelerator

DESY/Germany

Inst

DESY/Germany

Thank you for your attention!