

DEMCON

Experience with big science projects

ERIC MEULENKAMP

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New Business Development Manager

eric.meulenkamp@demcon.com

DEMCON & Big Science

- Engineering-as-a-Service
 - design, development and realization of complex (opto-)mechatronic modules
 - typically, between TRL3 and TRL8; one-of-a-kind or first-of-a-kind
- Specific products / prototypes using own IP
 - related to cryogenics, laser systems, PLD
 - (early) development part of the work
- Projects with several BSO's (or related) & strong interest to do more
 - A.o. ESO, ESA, UKRI, UKAEA, ET
- Experience with commercial projects with similar complexity
 - Liquid metal, molten salt, space, Lighthouse (radio-isotope production), ASML tools, ...

Engineering Design Services (EDS)

UKAEA FUSION REACTOR
CENTRAL LASER FACILITY

Customer objective

- EDS in modelling & analysis, controls & instrumentation, optics & mechanics, system engineering
- *E.g.*, support to increase peak power of the Vulcan laser 20x to 20PW (400J in 20fs)

Challenges

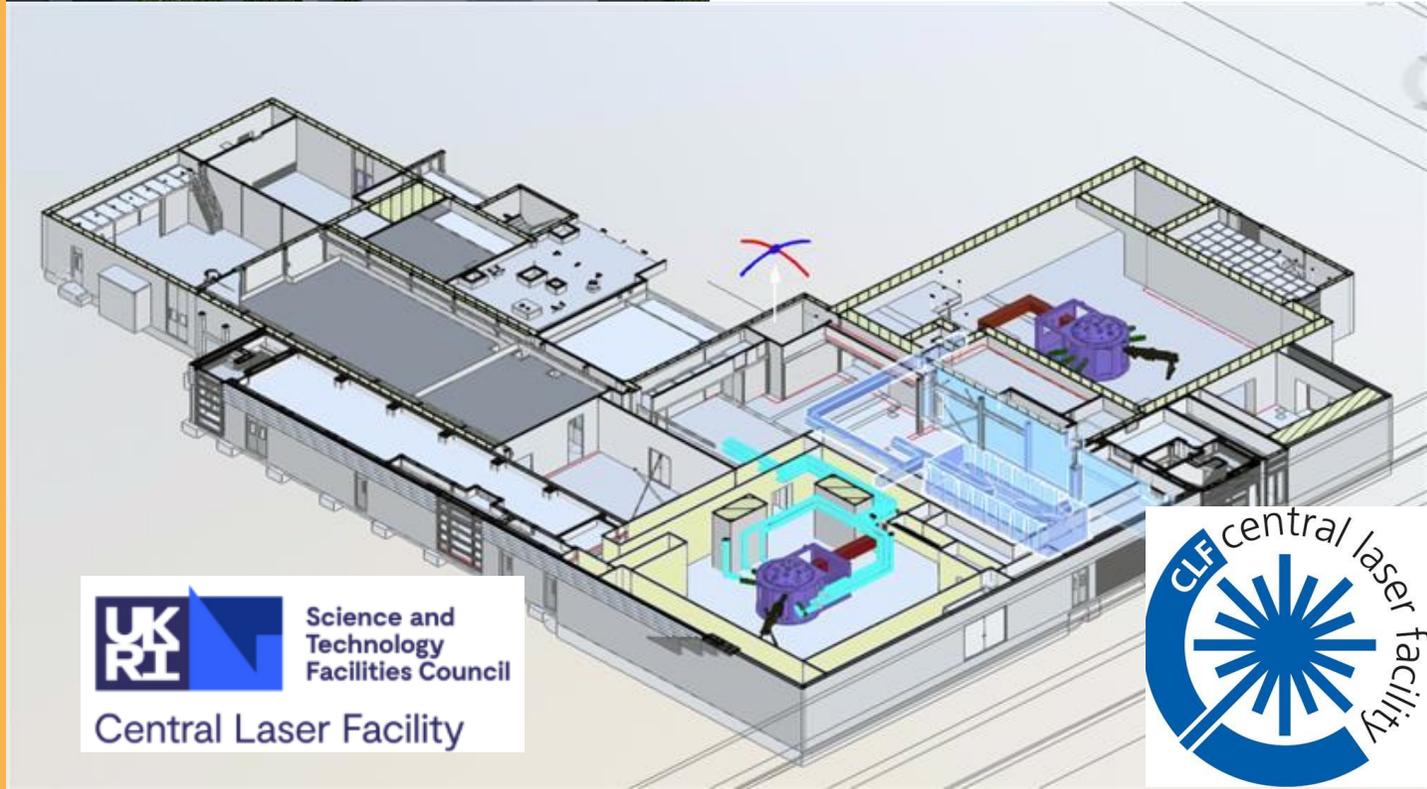
- AC losses in HTS coils
- Simulations tuned to UKAEA's bespoke project
- Thermal deformation in laser gain media
- Laser optics cooling

Approach

- Multiphysics
- PoP, PoC
- Reviews with UKAEA/UKRI scientists



UK Atomic
Energy
Authority



Einstein Telescope

ZERO VIBRATION 10 KELVIN CRYO-COOLING OF OPTICAL MIRRORS

Customer objective

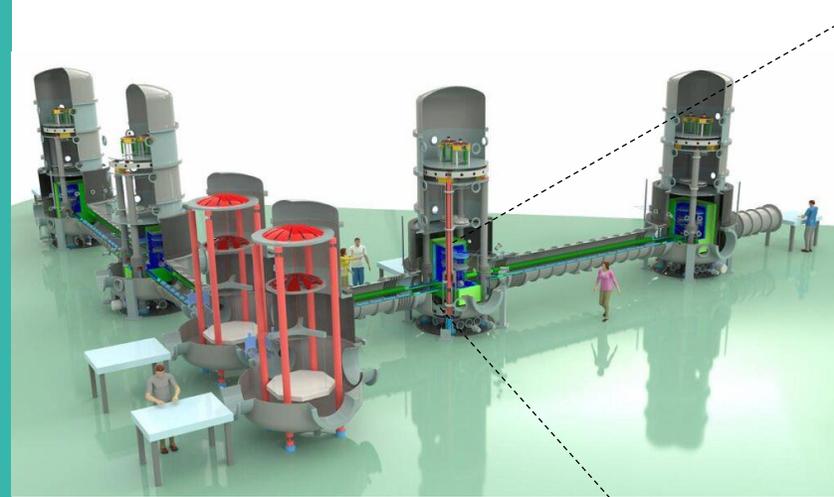
- Next generation gravitational wave observatory
- Technology benchmark in ETPF

Challenge

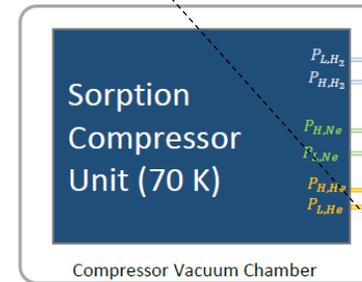
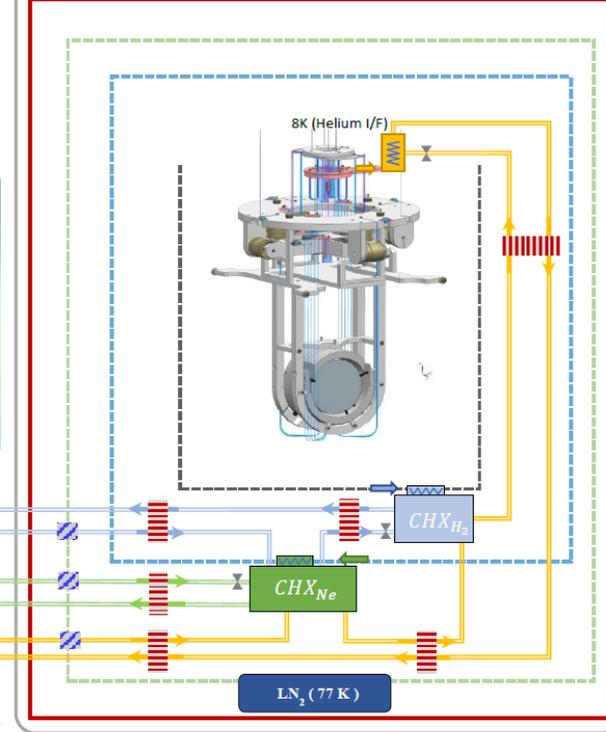
- Generate 50 mW @ 10 K in the “heart” of the system to cryo-cool low-noise mirror coatings
- Extremely low vibration level of cooling device < 30 nm p2p at 2–10 Hz

Approach

- 3-stage Joule-Thomson – Linde-Hampson cycle
- 3-stage sorption-based gas compressor



Cycle concept



ETPF test facility
University of Maastricht



ETPF cryo-test facility
University of Twente

Extremely Large Telescope

BEAM CONDITIONING AND DIAGNOSTIC SYSTEM (BCDS)

Customer objective

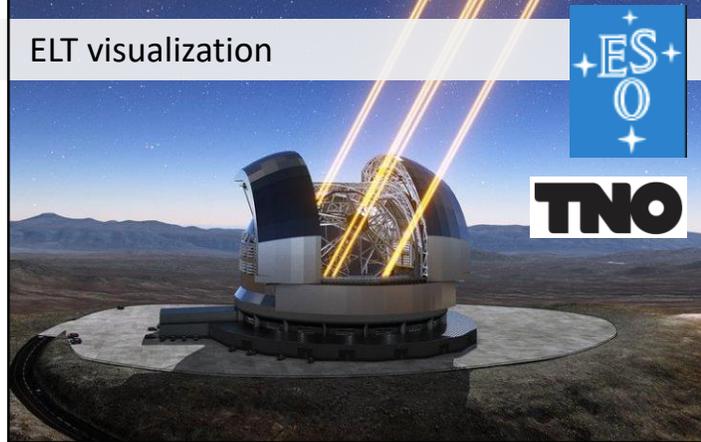
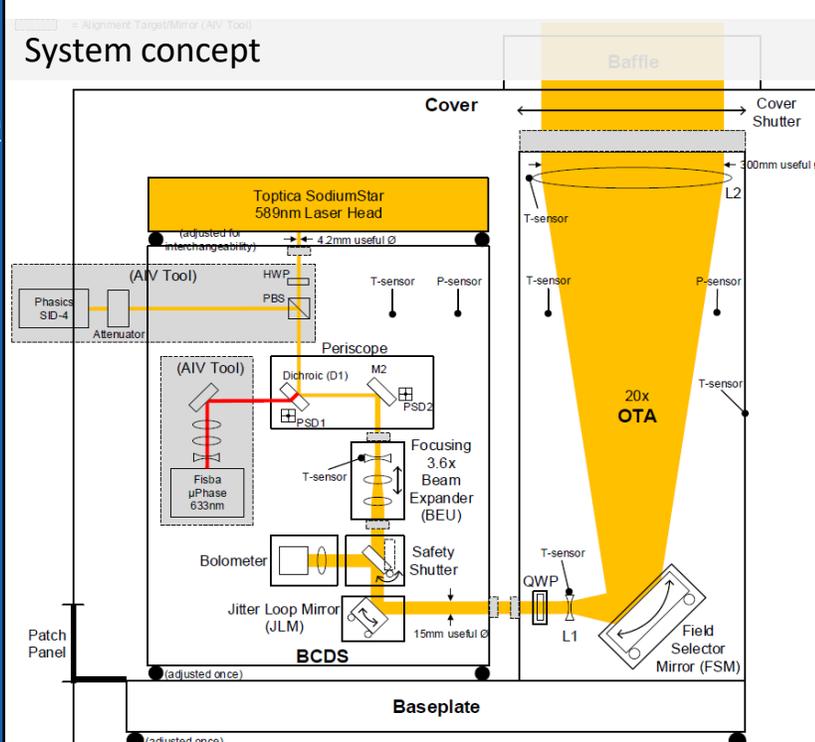
- Artificial reference stars to enable correction for blurring by atmospheric turbulence
- Obtain nine Laser Projection Subunits (LPS) to be integrated in the ELT

Challenge

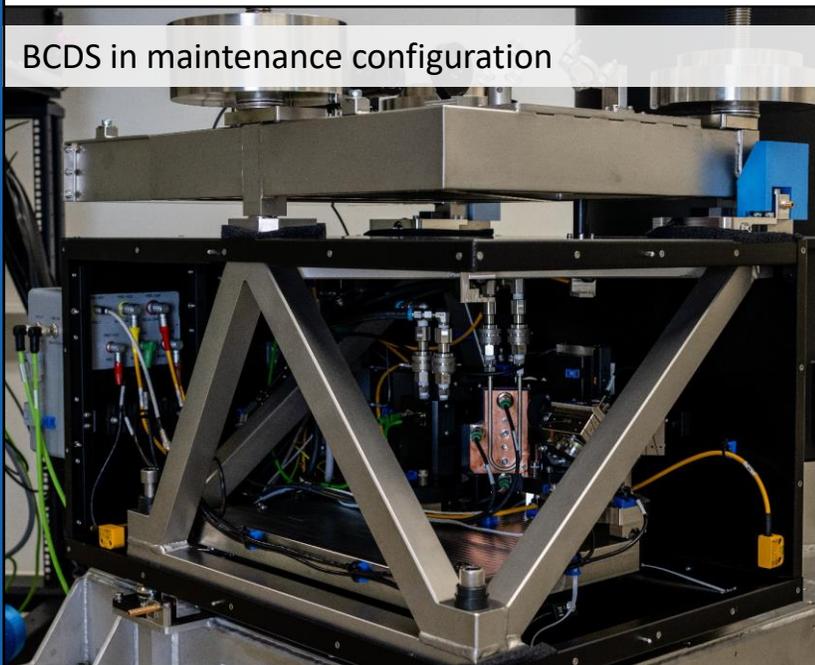
- Beam quality and beam positioning for Field of View and temperature range

Approach

- TNO contractor to ESO; Demcon does BCDS design, manufacturing and verification
- First BCDS under test at ESO



LPS 1 in the laboratory for testing



Experience & insights

- Build up (personal) relationship with program / project / procurement officers to better understand the background and objectives of tenders: 'cold tendering' is tough
- Better chance if you have prior experience with the same topic (or very close) : given relatively high cost, NL can win on quality / unique capability
- Team up!, with RTO, specialized SME, large player, ... : stronger together
- Be tenacious and ensure buy-in in own company up to C-suite: strategic fit, sizeable effort, early involvement of Legal, F&A, staff availability
- Go for A+ : win on quality in plan (technical content), and in submission
- Be prepared to work according to BSO WoW: stage gates, documents, compliance, ...
- Fun in execution!: very knowledgeable counterparts, unique challenges, locations, work cultures, ...
- Best case: complementary know-how at BSO, act as one R&D&E team