

# Fusion Demonstration Plant

UKAEA 8<sup>th</sup> Supplier Event

Warren Edwards – Director of Procurement, Contracts & Materials Management

**generalfusion**<sup>®</sup>

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# Introductions

The logo for generalfusion, featuring the company name in white lowercase letters on a red rectangular background.A detailed architectural rendering of a modern building's interior. The space is characterized by a high ceiling with a complex, curved structure of yellow and red beams. Large glass windows allow natural light to fill the space. In the background, several people are visible, providing a sense of scale and activity within the building.

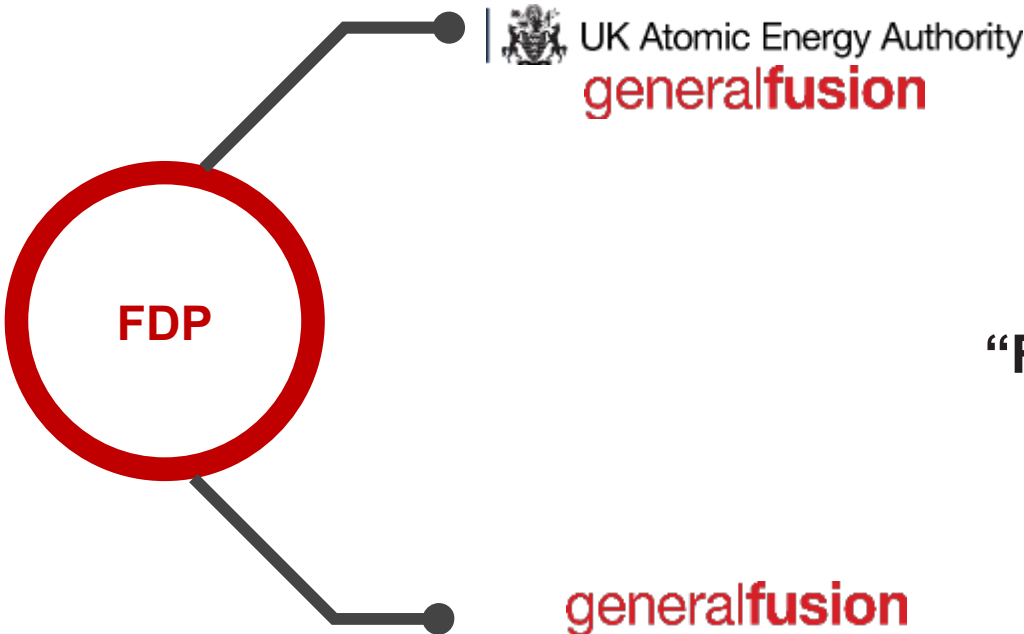
**Warren Edwards** – Director of Procurement

**Matthew Bloodworth** – Technical Program Manager

**Lewis Meredith** – Senior Mechanical Engineer

**Martin Watkins** – Senior Civil & Structures Engineer

# Project Phase Definition



## “Shell & Core” Phase 1



- GF UK Team led design, construction under UKAEA’s mature procurement and project execution systems
- Includes everything from early site works to basic building occupancy level of completion
- Final design and construction responsibility competed under UKAEA’s Main D&B Contractor framework

## “Fit-out” Phase 2



- GF UK Project Team led design, procurement, manufacturing, assembly and construction
- Includes the Fusion machine assembly, balance of plant (BOP) process systems, all building support systems, life safety systems and building tenant finish
- Integrated facility and Fusion machine commissioning and startup, leading to handover and science operations



# FDP UK Engineering, Design and Construction Team



generalfusion

AL\_A

HATCH

ARUP

Turner & Townsend

*New D&B Contractor - TBD*

## UK based specialty sub-contractors and consultants

- **Seam Design** - Lighting studies and designs
- **BSP Consulting** - local traffic analysis, simulation and control studies
- **RIDGE** - principal designer for health and safety
- **Fabrik** landscape studies and designs
- **Lockhart Garrat** - ecology and biodiversity assessments and reports
- **Cotswold Archeology** - archaeology studies, field assessments, and reports
- **Concept Drilling** - GeoTech drilling and environmental soil and water sampling
- **ARUP & HATCH Fire** - detailed safety and fire hazard assessments
- **Wilkinson Construction** – approved building control inspector and fire safety
- **ARUP sustainability** - life cycle carbon assessments and daylight, sustainability and advisor for BREEAM
- **Hatch and Clark Saunders Acoustics** - environmental noise analysis, field measurement assessments and detailed acoustics modelling
- **Carter Jonas** – UKAEA planning consultant
- **McBains** – check engineering and construction consultants for UKAEA
- **Turner & Townsend**- independent cost analysis and estimates
- **Allelys Heavy Haulers**- Heavy loads transportation routing studies, hauling and lifting services
- **Nuvia** – Radiological consulting, studies and site surveys
- **Multiple others**

# Procurement Challenge

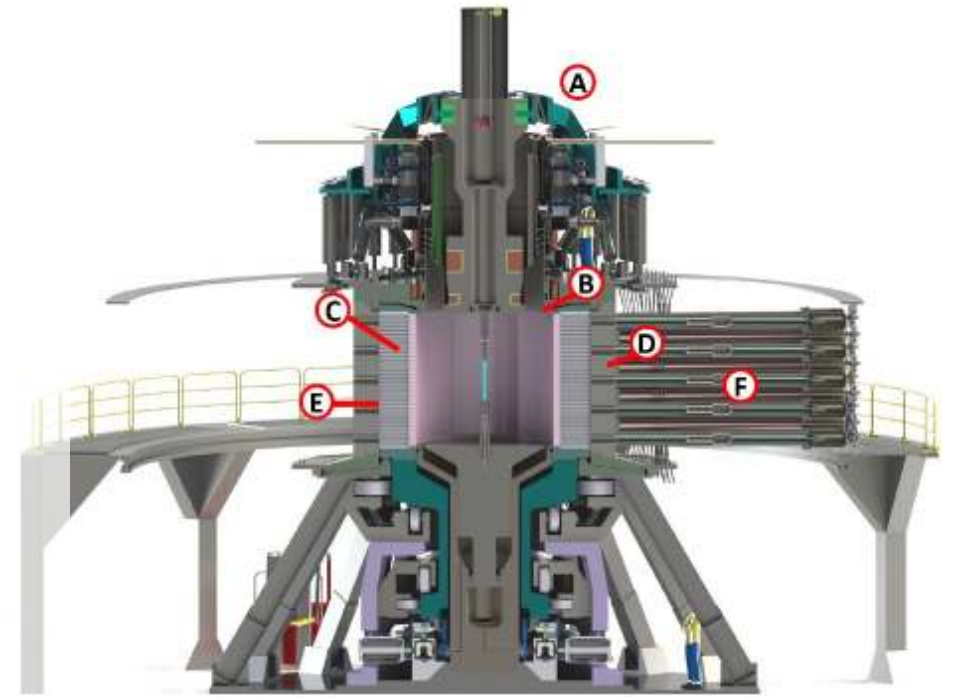
- **Establish a UK based procurement Function**
- **Aiming to mirror UKAEA Supplier Experience**
- **Promoting the project to the relevant supply chain around the UK**
- **Focusing as much spend with UK firms as possible**
- **Sourcing & procuring first of a kind materials, components and parts.**





# FDP Fit-out Pipeline Contracts

- Fusion Island
  - Plasma Injection System (A)
  - Compression System (E) (C) (D) (F)
  - Diagnostic & Control System
- Balance of Plant Equipment & Fit-out
  - Fusion Machine Maintenance & Assembly Facilities
  - Fusion Support Facilities
  - Workshops & Storage
  - Mech./Elec./ Control Rooms
  - Offices & Employees facilities Fit-Out (approx. 50 people)
  - External Services
  - Process Electrical Supply
  - Lifting/Moving equipment



# Plasma Injection System

## Procurement Approach

- Multiple packages (TBD)
- Expected mix of procurement arrangements including supply, supply & install, speciality commissioning, etc.



## Preliminary Expected Procurement Opportunities

- Vacuum System (valves, instruments, turbo pumps, cryo pumps, roughing pumps, control interface etc)
- Pulsed Power System (8MJ capacitor bank and switch gear, inc. other system components)
- Magnet System (stabilising the plasma as it is injected into vessel, 7 coils expected)



# Compression System

## Procurement Approach

- Multiple packages (TBD)
- Expected mix of procurement arrangements including supply, supply & install, speciality commissioning, etc.



## Preliminary Expected Procurement Opportunities

- Drive Gas System (various tanks inc high pressure cryogenic tank, compressors, Helium purification system, vacuum pumps, heat exchangers, chillers, filters, liquid nitrogen, etc.)
- Liquid Lithium System (melting and purification vessels, pumps, vacuum pumps, pipework, heating elements, etc.)
- Custom fabrications (Rotor Drive, Fusion Vessel)

# Diagnostic & Control System

## Procurement Approach

- Multiple packages (TBD)
- Expected mix of procurement arrangements including supply, supply & install, speciality commissioning, etc.



## Preliminary Expected Procurement Opportunities

- Diagnostics Systems (Magnetic field, Neutron Spectroscopy, Thomson Scattering, X-Ray, High speed imaging, etc.)
- Process Control System (Main control of fusion island, data logging, Interlock safety systems, HMI interfaces, etc.)
- Custom fabrications (Plasma injector)

# Balance of Plant Equipment & Fit-out

## Procurement Approach

- Multiple design, supply and install packages (TBD)
- Packages contracted directly to our EPCM
- Packages directly procured by GF



## Preliminary Expected Procurement Opportunities

- Fusion Machine Maintenance & Assembly Facilities (plasma injector room, compressor driver room, Diagnostic Room)
- Fusion Support Facilities (Drive Gas and Fusion Machine)
- Workshops & Storage (Machining Workshop, Vacuum/Clean workshop, Warehouse, loading doc)
- Mech./Elec./ Control Rooms (Mech room, power room, head recovery, process coolant, water glycol coolant, Argon system, Steam distribution), including Process Electrical Supply (20MVA connection to Culham supply)
- Offices & Employees facilities Fit-Out (Reception, Offices, Wellness, Kitchen/Cafeteria, changing rooms, Lab Spaces)
- External Services (Process water & cooling, water/glycol cooling, Helium and Argon equipment)
- Lifting/Moving equipment (250ton Polar Crane, forklifts, gantry cranes, jib crane, etc.)

# Vendor List

General Fusion is developing a list Vendors who may be interested in providing goods and services to the FDP. If you are interested in the learning more about General Fusion FDP managed Procurement Opportunities please:

**01**

## Email Us

Reach out to us noting your interest and we'll follow-up for additional information. Send all emails to **FDP.Procurement@GeneralFusion.com**

**02**

## Drop by the booth afterwards

We'll have representatives at the booth (in person or virtually) this afternoon. Please feel free to stop by and introduce yourself.

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