

# ESS Target Internal Transport Casks



The European Spallation Source (ESS) is a multi-disciplinary science and research facility under construction near Lund, Sweden.

The ESS vision is to build and operate the world's most powerful neutron source, enabling scientific breakthroughs in research related to materials, energy, health and the environment.

Central to the facility is the Target Station where high-energy proton pulses are directed to a Target Monolith where spallation occurs, generating a vast number of neutrons. Items within the monolith become radioactive through high energy particle activation.



## STAKEHOLDERS

Client: European Spallation Source

## LOCATION

Country: Sweden

Area: Lund

## VALUE

£5.5M

## SCOPE

The NUVIA scope was the system (scheme) and detailed (build-to-print) design of the target internal transport casks and associated interfacing equipment, otherwise known as the cask assembly.

The cask assembly comprises all the equipment necessary to interface with the monolith and handle its component parts. This includes the shielded casks, gamma gates, lifting devices, maintenance and decontamination facilities.

## PROJECT CHALLENGES

The primary function of the cask assembly is the safe and robust transportation of multiple large and highly irradiated components from the monolith during maintenance operations. This requires the cask assembly to provide shielding and containment throughout the process, i.e. all steps of hoisting, transport and storage within the facility.

Key interfaces include the high bay crane (and high bay crane control system), Active Cells Facility (ACF), and the monolith components.

## TECHNICAL SOLUTIONS

To safely remove and replace the components requires a range of 9 casks. A range of 5 gamma gates is also required for each of the docking points for the casks of which there are 4.

Each cask is provided with a hoist system and lifting devices to

interface with the monolith components.  
 A range of 6 different hoist systems is required to accommodate the different component weights.  
 A range of 13 different lifting devices is required to interface with the 26 monolith components.  
 The casks will be transferred between the different interface stations using the high bay crane.

## PROJECT CONCLUSIONS

NUVIA's solution for the 7No Casks and associated equipment was delivered in late 2021.  
 This has allowed procurement of the components to be completed; the first of the 7 Casks started manufacture in Q4 2022. The remaining 6 casks will start manufacture in Q2 2023.

## KEY FIGURES

- 26 highly irradiated monolith components
- Up to 5m high and 2.6m diameter
- Up to 60 tonnes
- Up to 700 Sv/h

## INNOVATION

The European Spallation Source is a first of a kind development.  
 NUVIA's solution was tailor made to meet the very specific requirements set down by the Client.

## KEY DATES

Start Date: 19.08.2019  
 Completion: 10.09.2021  
 Accidents: Zero

## CONTRACTORS

SCX Special Projects  
 Design of grapples and hoists

Capula:  
 Electrical design

## KEY PEOPLE

Project Manager: Mark Johnson  
 Nominated Engineer: Kevin Moss  
 Commercial Manager: Steve Earith

## MORE INFORMATION

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This project profile was updated in March 2023.





