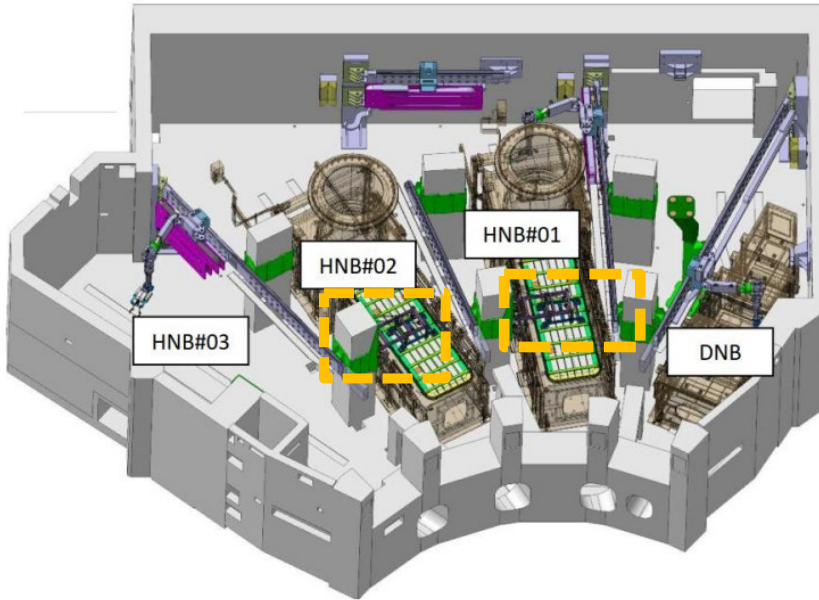


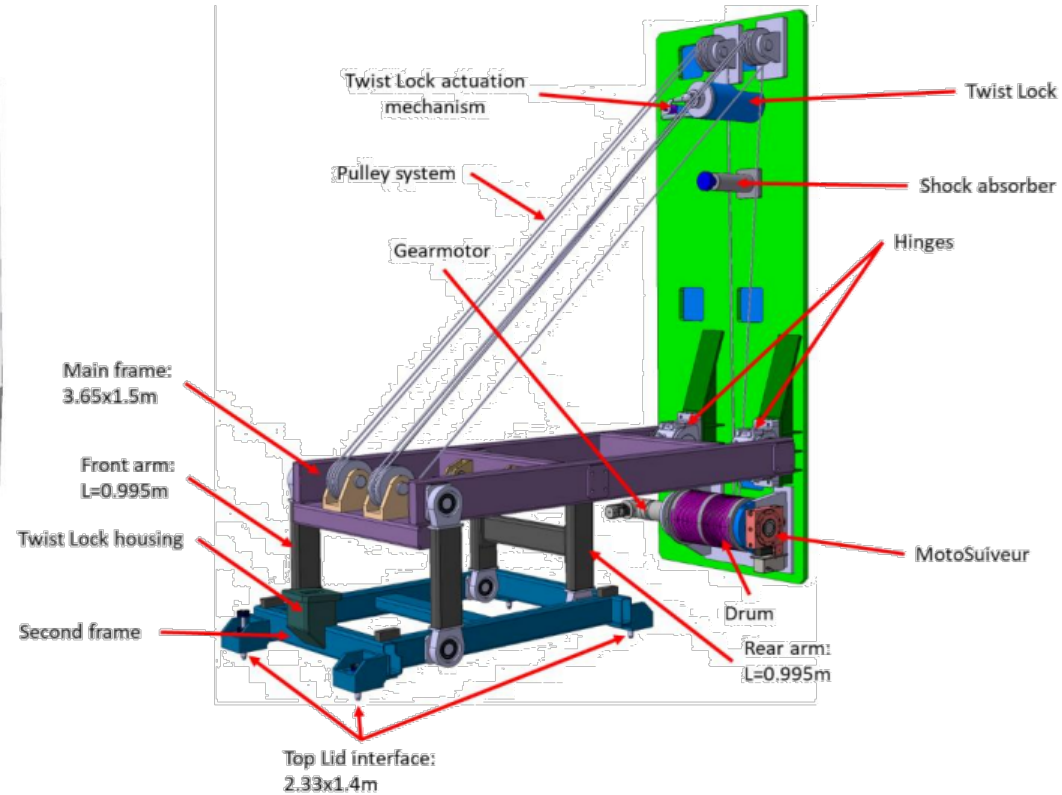
# NBRHS - Top Lid Opening Mechanism

## Heating Neutral Beam vessels' top lid operations

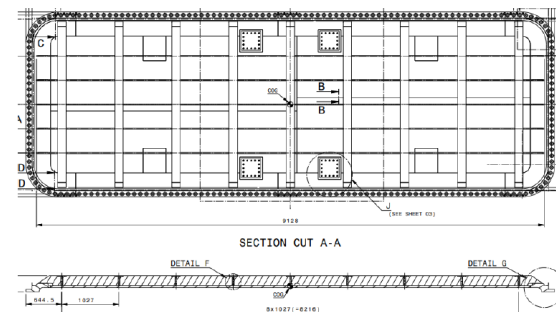
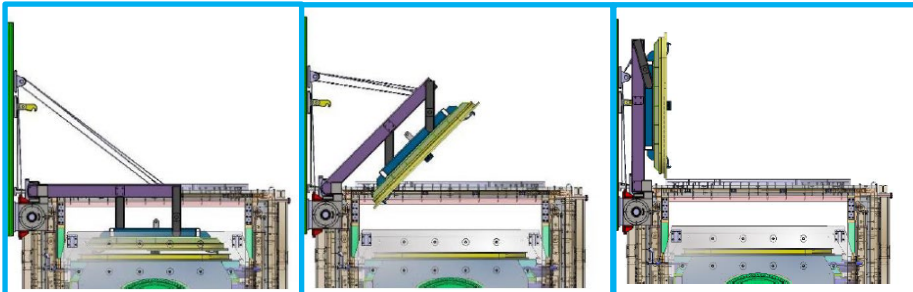
### Tokamak Building --- Neutral Beam Cell



The TLOM is a permanent, resident and FINAL remote handling system



### Basic actuation principle



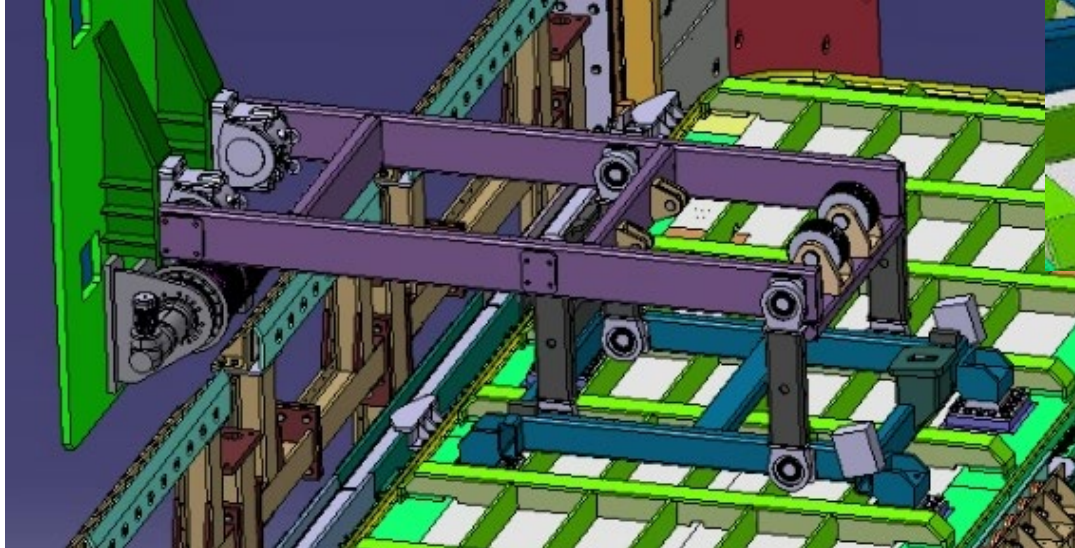
**BLV Top Lid:**  
**9.642L**  
**3.517W**  
**0.394H**  
**17.5 tons**

# NBRHS - Top Lid Opening Mechanism

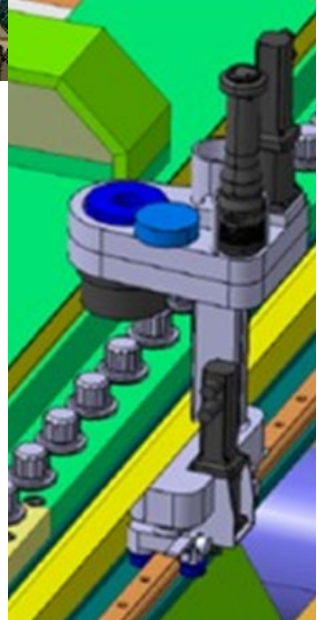
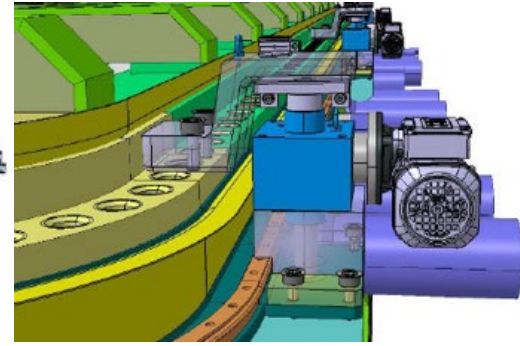
## Heating Neutral Beam vessels' top lid operations

### TLOM Ancillary systems

- Top Lid Jacking System
- Engagement System
- RH Guide Rails and Flange Bolting Tools
- Task modules



Top Lid Jacking System



Bolting Tools

# NBRHS - Top Lid Opening Mechanism

## Heating Neutral Beam vessels' top lid operations



### To summarise:

- Scope of supply is full 2 TLOM systems (HNB1 and HNB 2)
- Plus ancillary and necessary support systems including jacking tools, task modules, RH manipulation tools, among others.

These are final, resident systems: tolerance to mild-to-moderate levels of radiation apply. When such radiation resistance will be necessary, F4E will support to select radiation resistant components.

### Additionally:

- Resistance to earthquakes will also be considered for the safety of the systems themselves and the surroundings, noting that the Tokamak Complex is a seismically isolated building.
- Lubrication is limited as much as reasonably possible. When necessary, mitigation strategies (e.g. double sealings) will be implemented.