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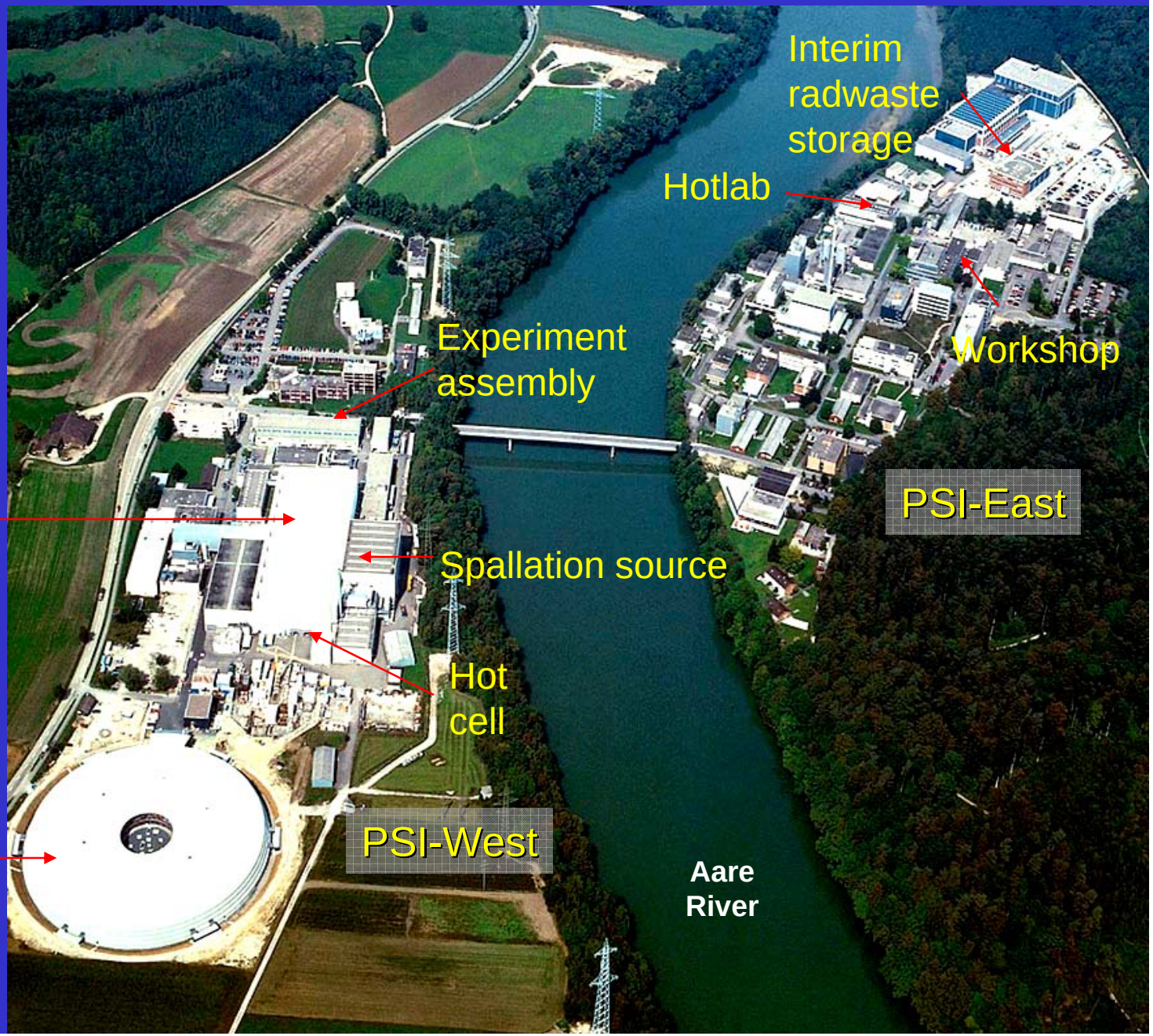
2nd High Power Targetry Workshop

ORNL Oct.10-13, 2005

Hajo Heyck PSI

Infrastructure of a high Power Neutron Spallation Source

Spallation Neutron Source SINQ at PSI



Proton Accelerator Facility

Synchrotron-Light Source SLS

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Infrastructure of SINQ Target Station contains:

- Heavy- and light water cooling systems
Handling equipment for shielded filters & ion exchangers
Dryer- & D2O recovery equipment
Protection suits with breathing air supply system

- Gas systems for He-, N, D2, compressed air
leakage monitoring systems
Gas cooling and filtering systems

-Control system and operation
Control room with switch yard, PLC´s, visualisation & operation, documentation

-Target handling-, storage- and disposal systems
Target exchange flask, adapters and target storage pit
Big hot cell with power manipulator and waste handling

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Infrastructure of SINQ Target Station contains:

Target- and experimental area managment group

Documentation and quality management of target production, target storage and target disposal

Mechanical design of targets and other equipment

Coordination of experimental areas like neutron guides, shutters, shieldings, personell safety systems etc.

Cold moderator group

Maintenance of cold moderator systems,

D2 handling, isolation vacuum & inertisation

Development of new cold moderators be.ultra cold neutrons

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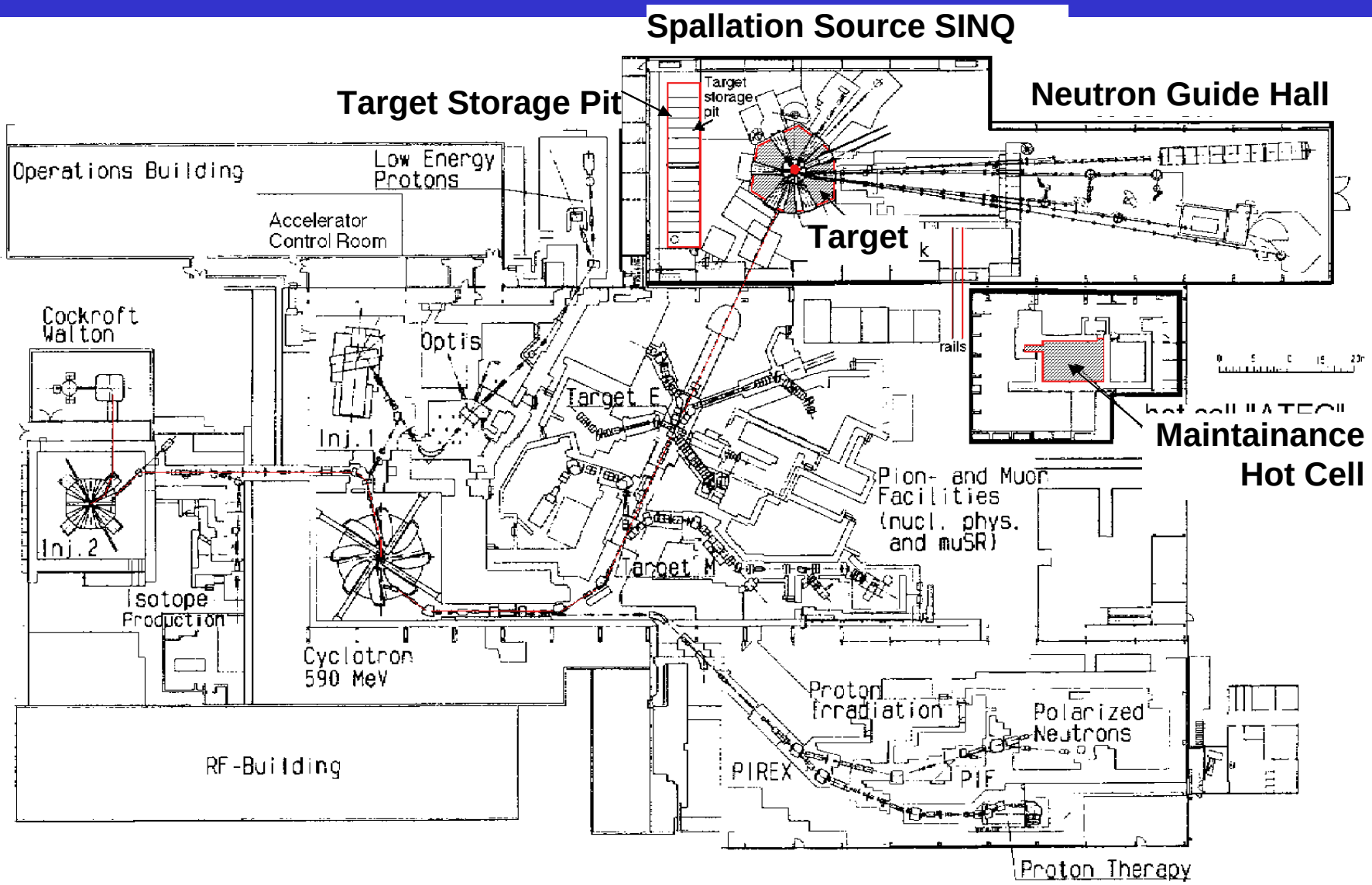
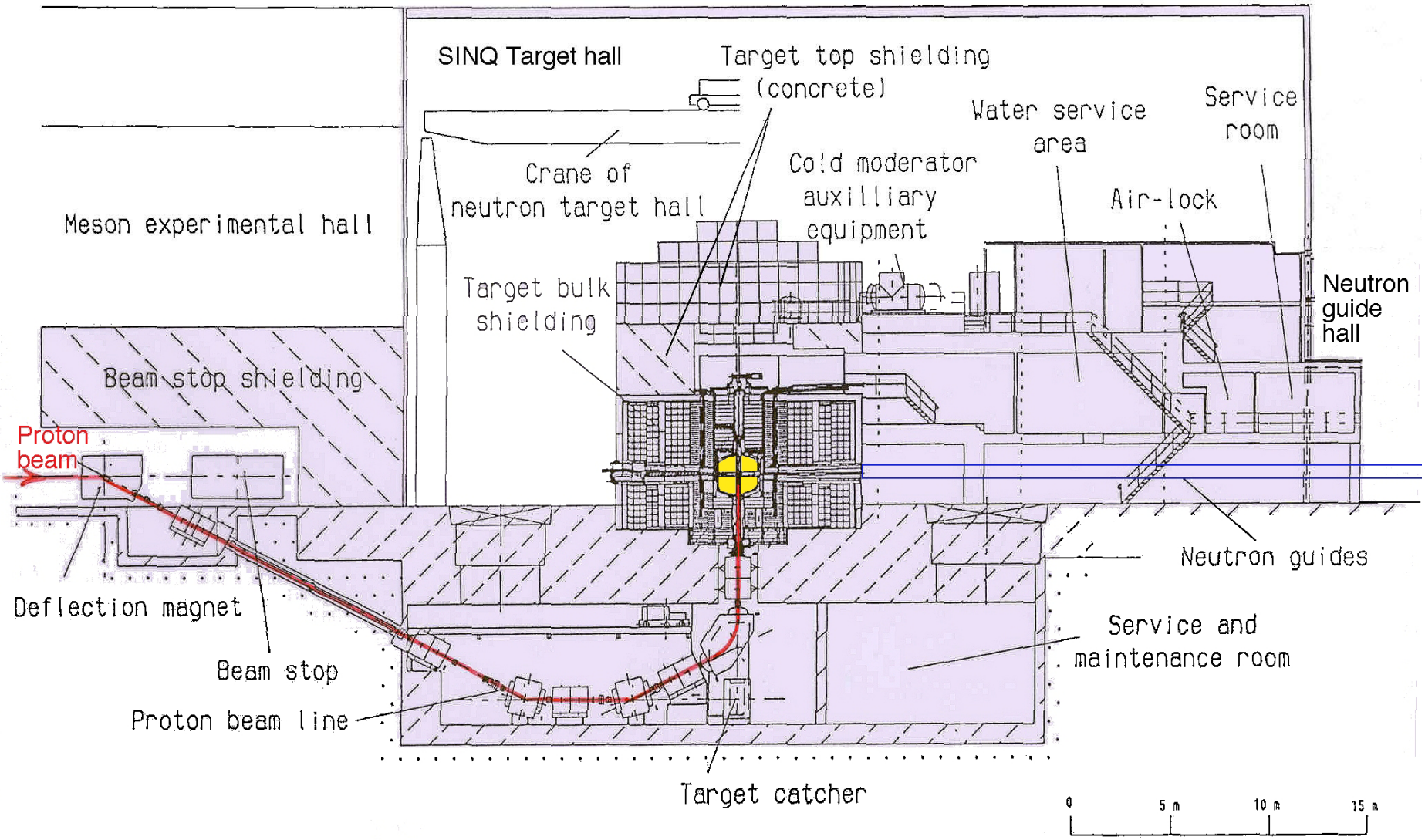
Shared Infrastructure of PSI contains:

- Proton accellerator operation
- Electrical mainteinance and I&C group
- Vacuum maintenance group
- Cryo service group
- Health physics, radiation protection and radwaste department
- Cooling water systems and piping&welding workshop
- Hot cell with operation group
- Crane operation and transportation group
- Mechanical design and manufacturing department
- Computing (network & desktop)

Accelerator and Neutron Source Facilities



Vertical Section of the SINQ Facility



Schematic Display of the SINQ Target Bock

Vertical section of SINQ targetblock

Zur Anzeige wird der QuickTime™ Dekompressor „TIFF (LZW)“ benötigt.

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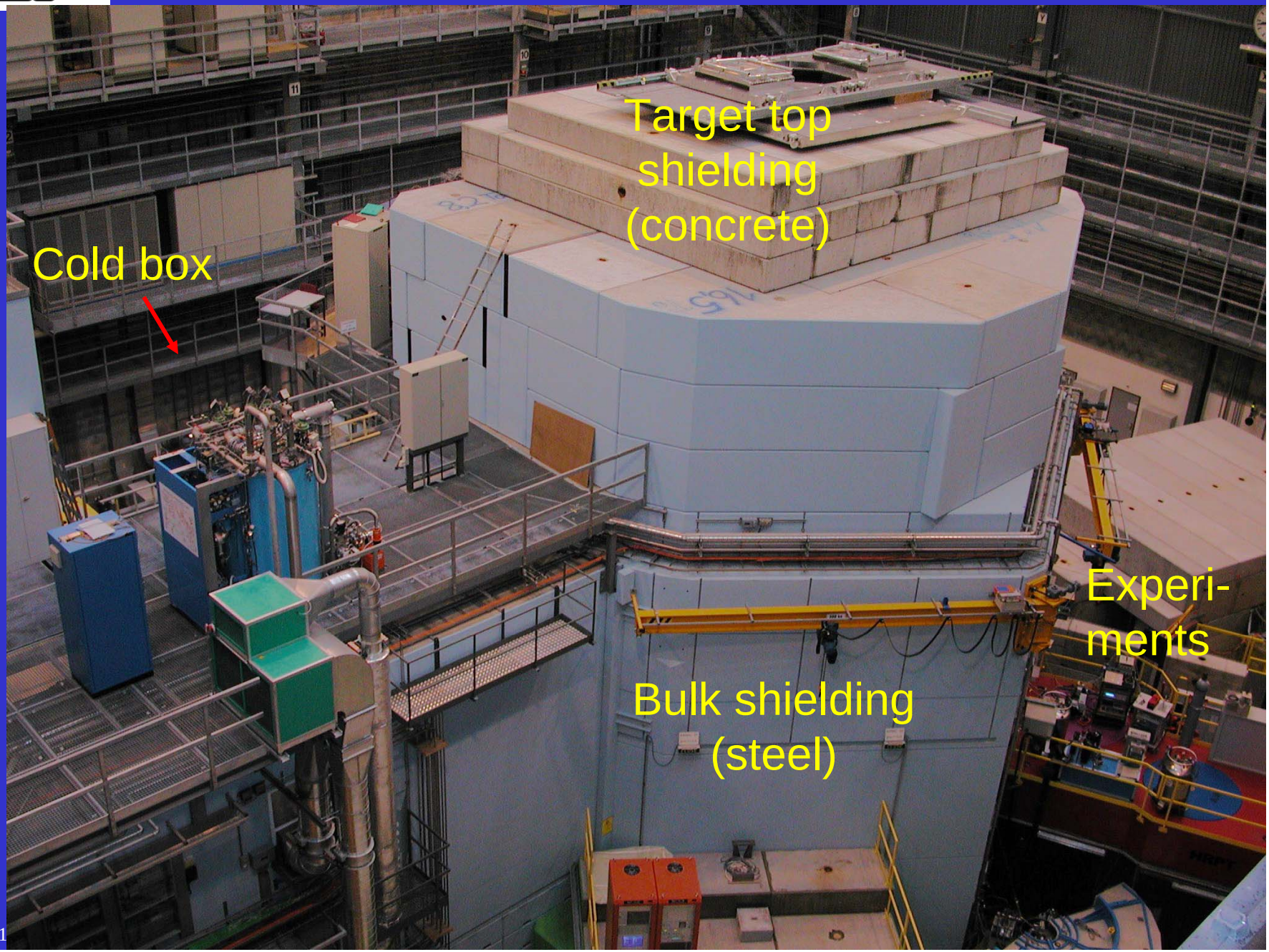
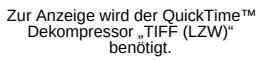
Horizontal section of SINQ targetblock

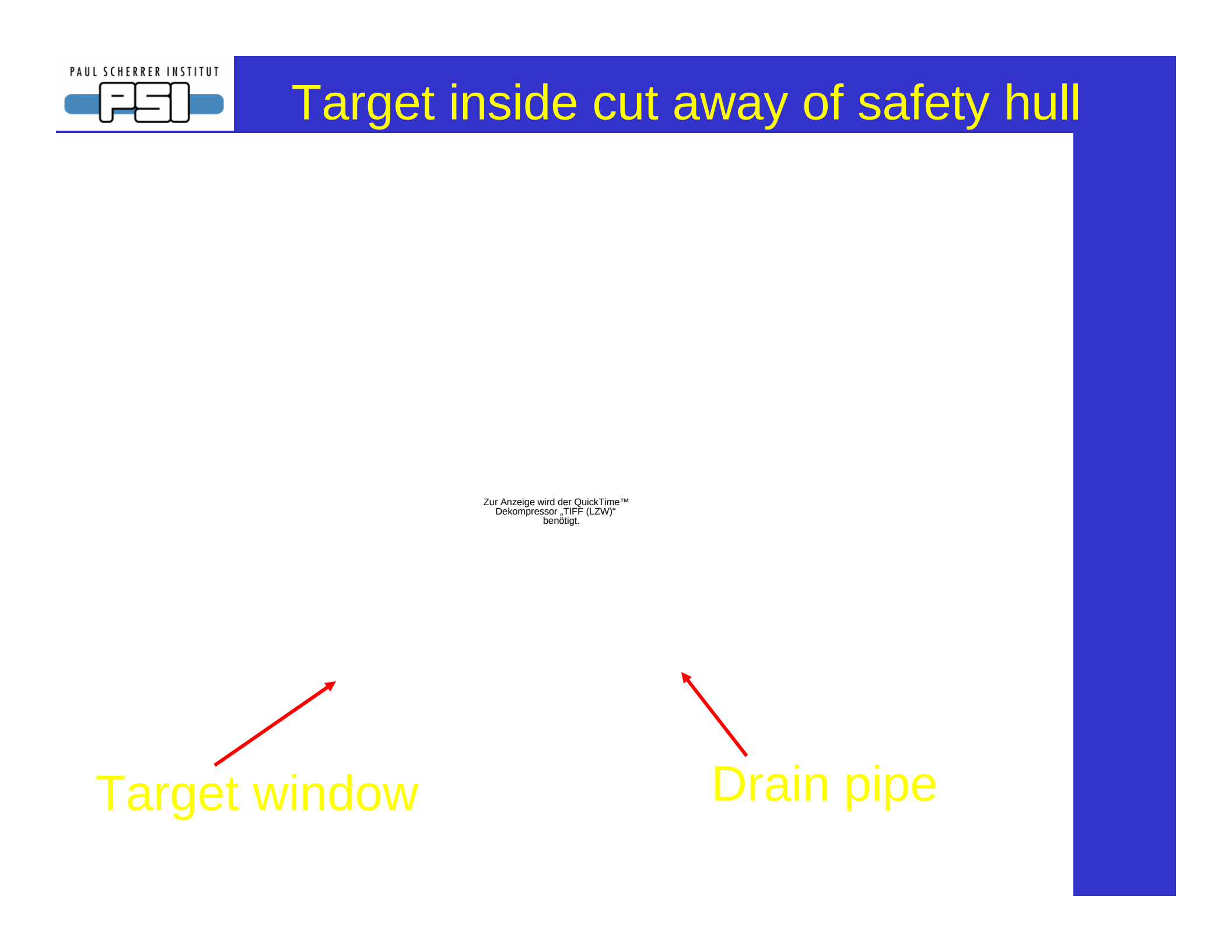
SINQ Targetstation



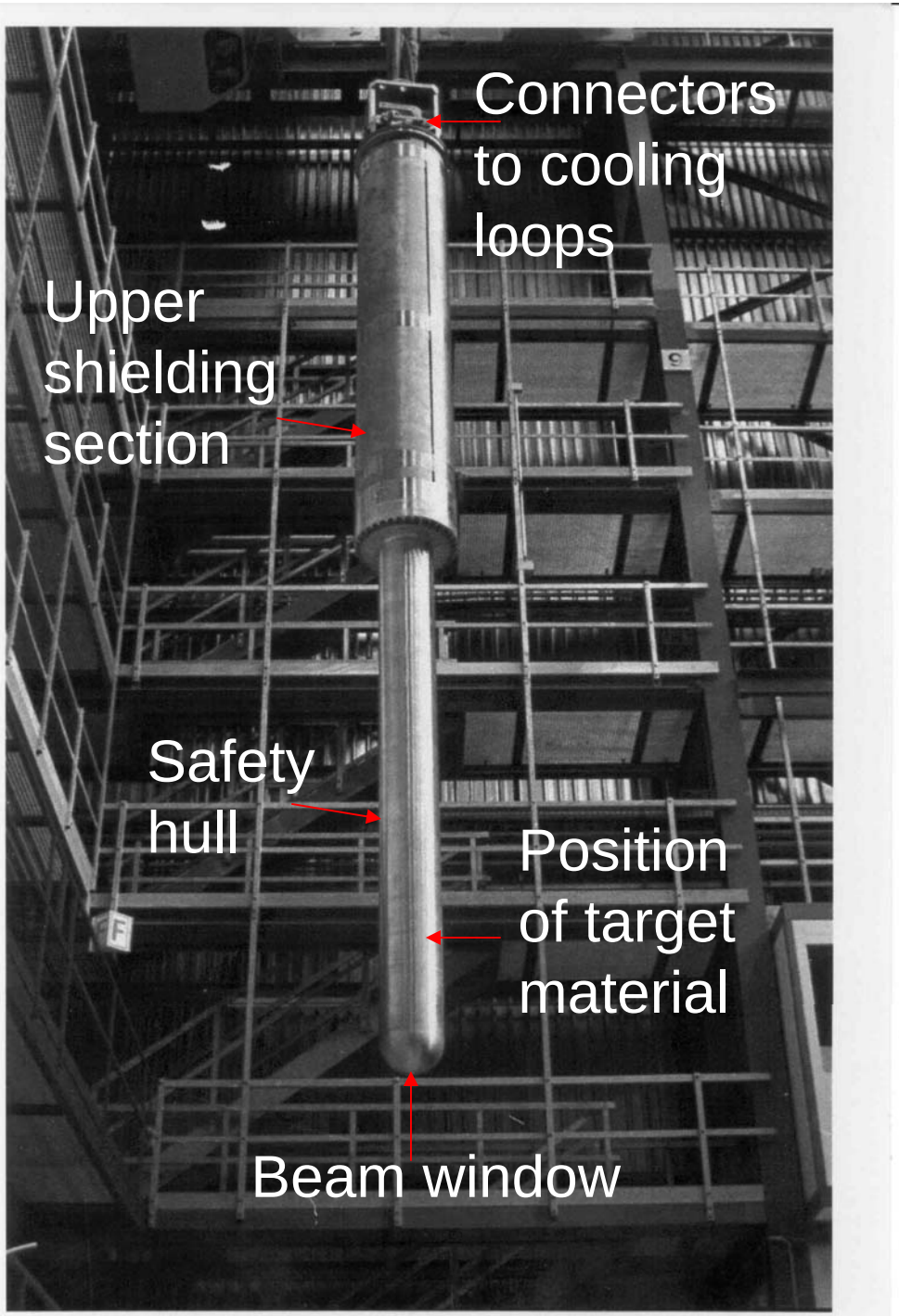
Assembled Target without hull



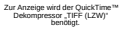
Target inside cut away of safety hull



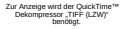
Unirradiated Target Insert on the Crane Hook inside the SINQ Target Hall



Disconnecting Target from Cooling Sys.



Connecting Exchange Flask to Target



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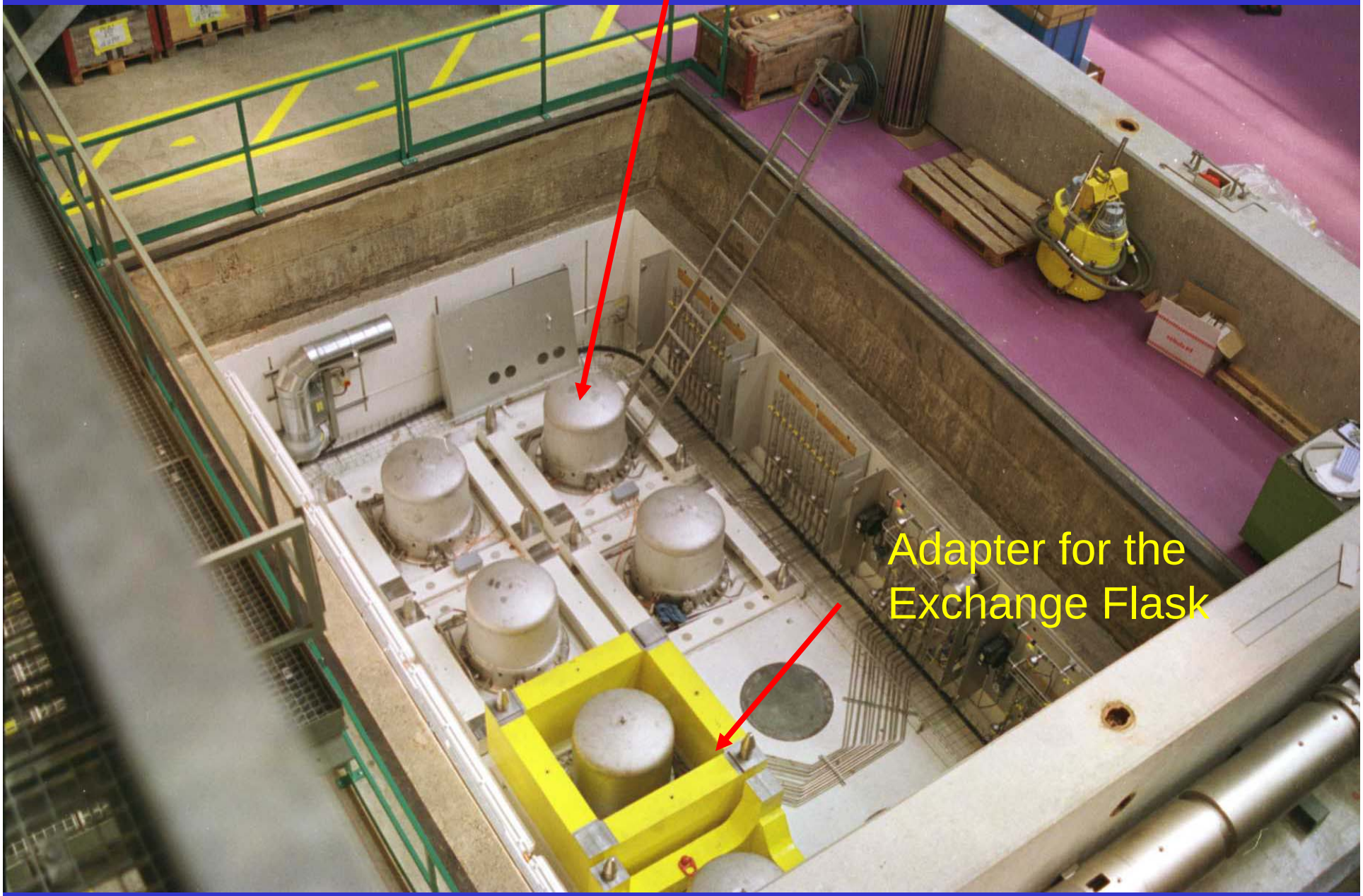
Target transfer to the target storage pit

Storage Positions in open Target Storage Pit



Target Storage

Target exchange flask on storage position inside the open target storage pit

Control cabinet of the target exchange flask

Target storage position

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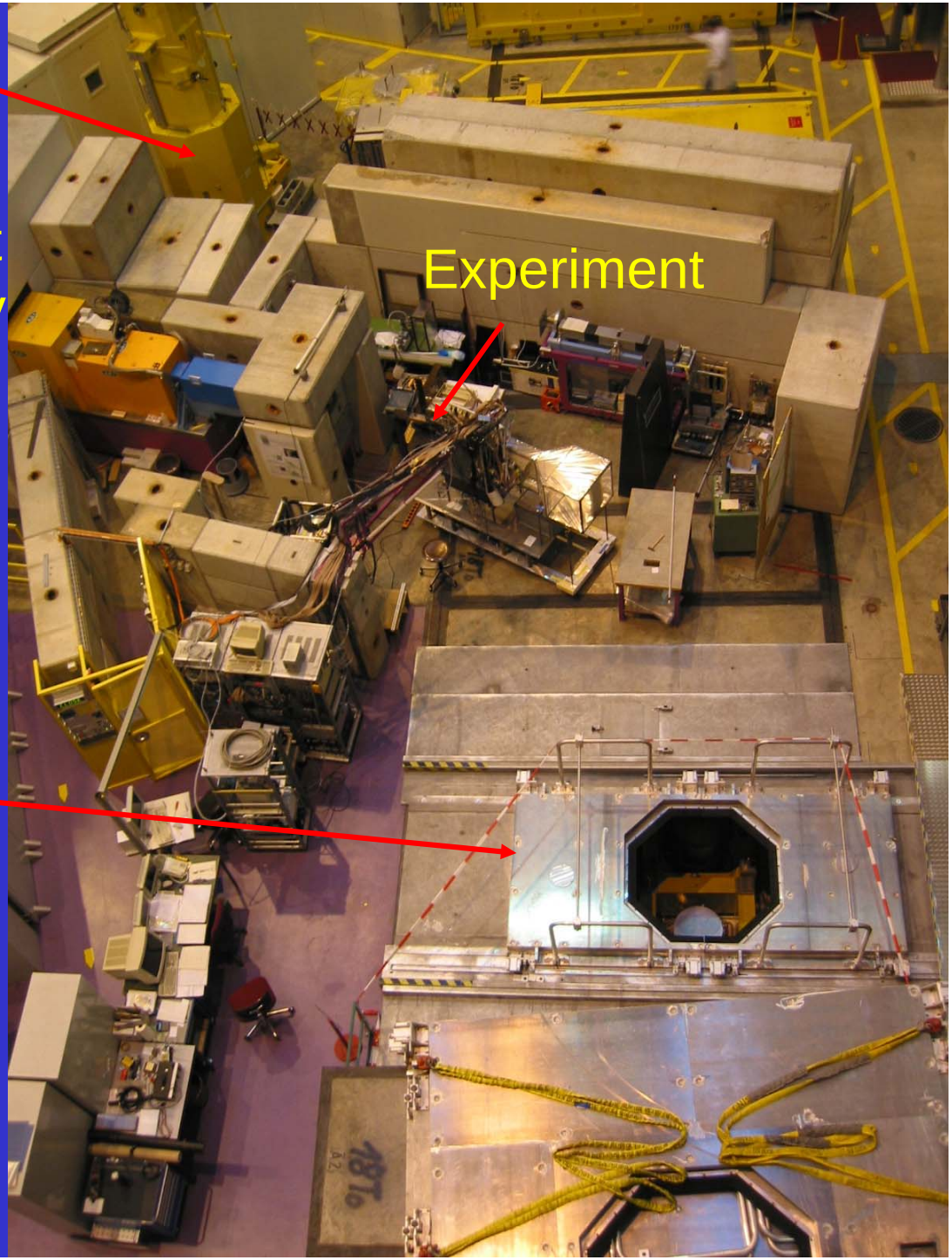
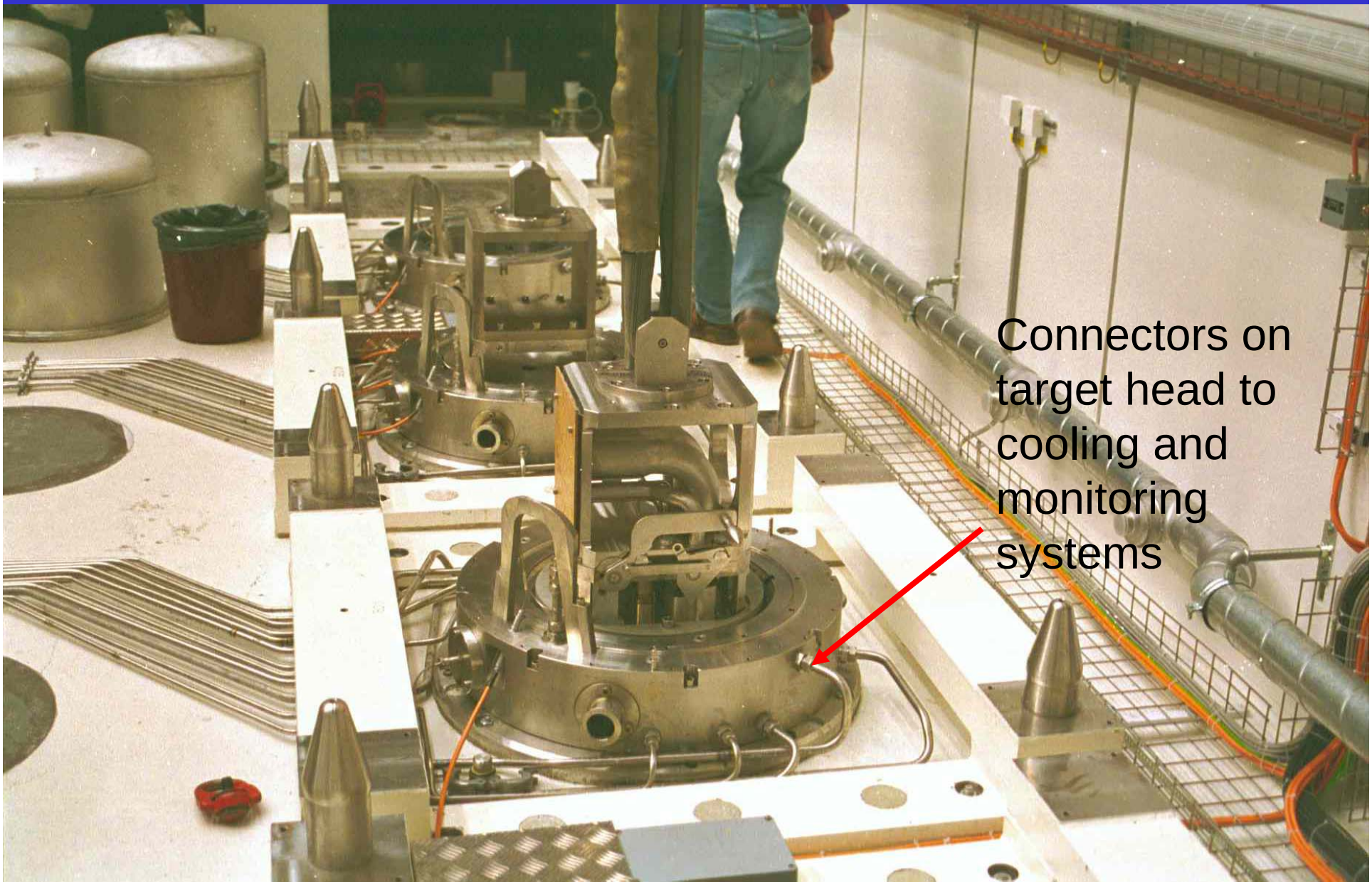
Exchange Flask

SINQ Target Storage pit with open position ready for target transfer with exchange flask

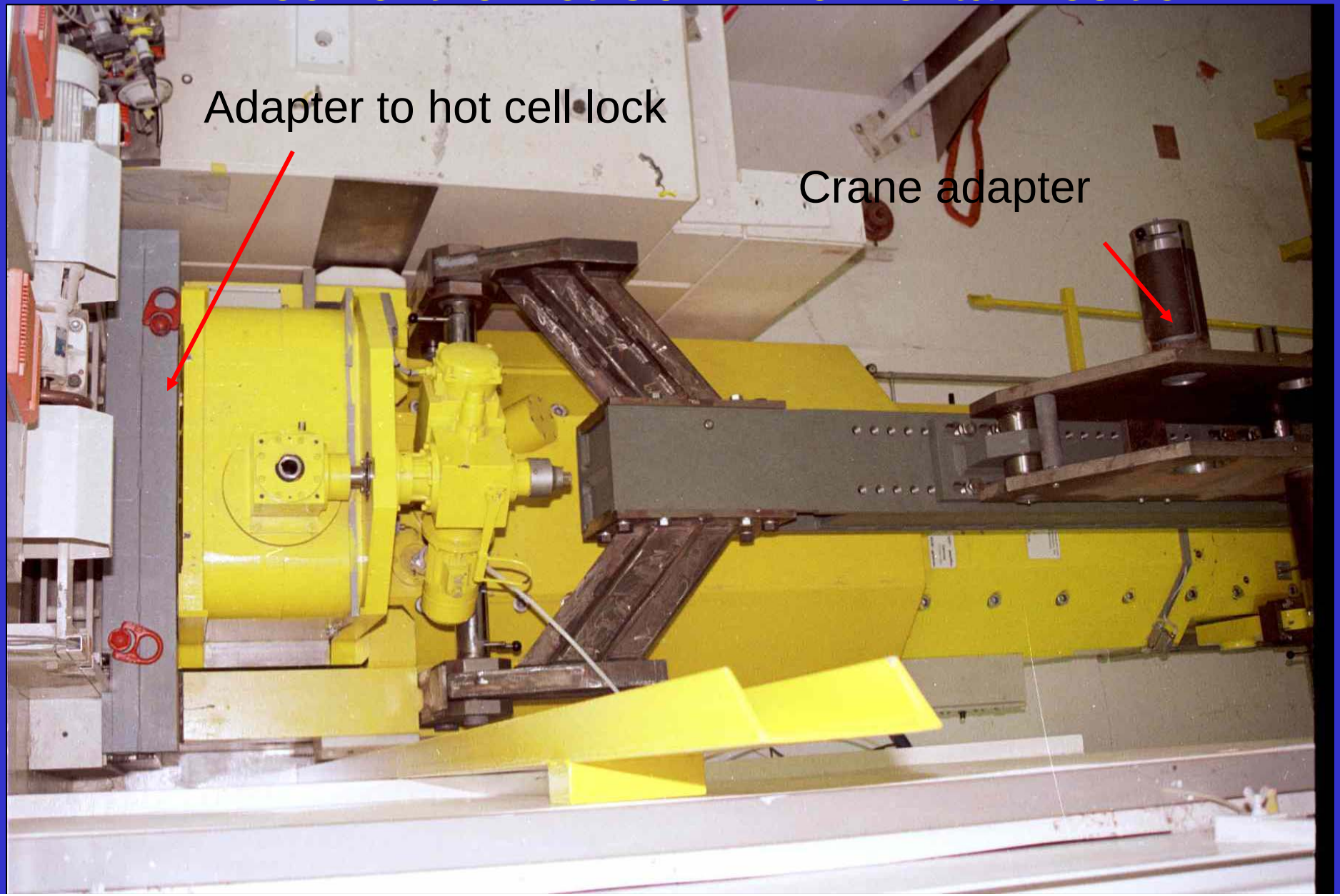
Temporary cover with flask hatch to maintain directed air flow around exchange flask preventing contamination outside the target storage pit



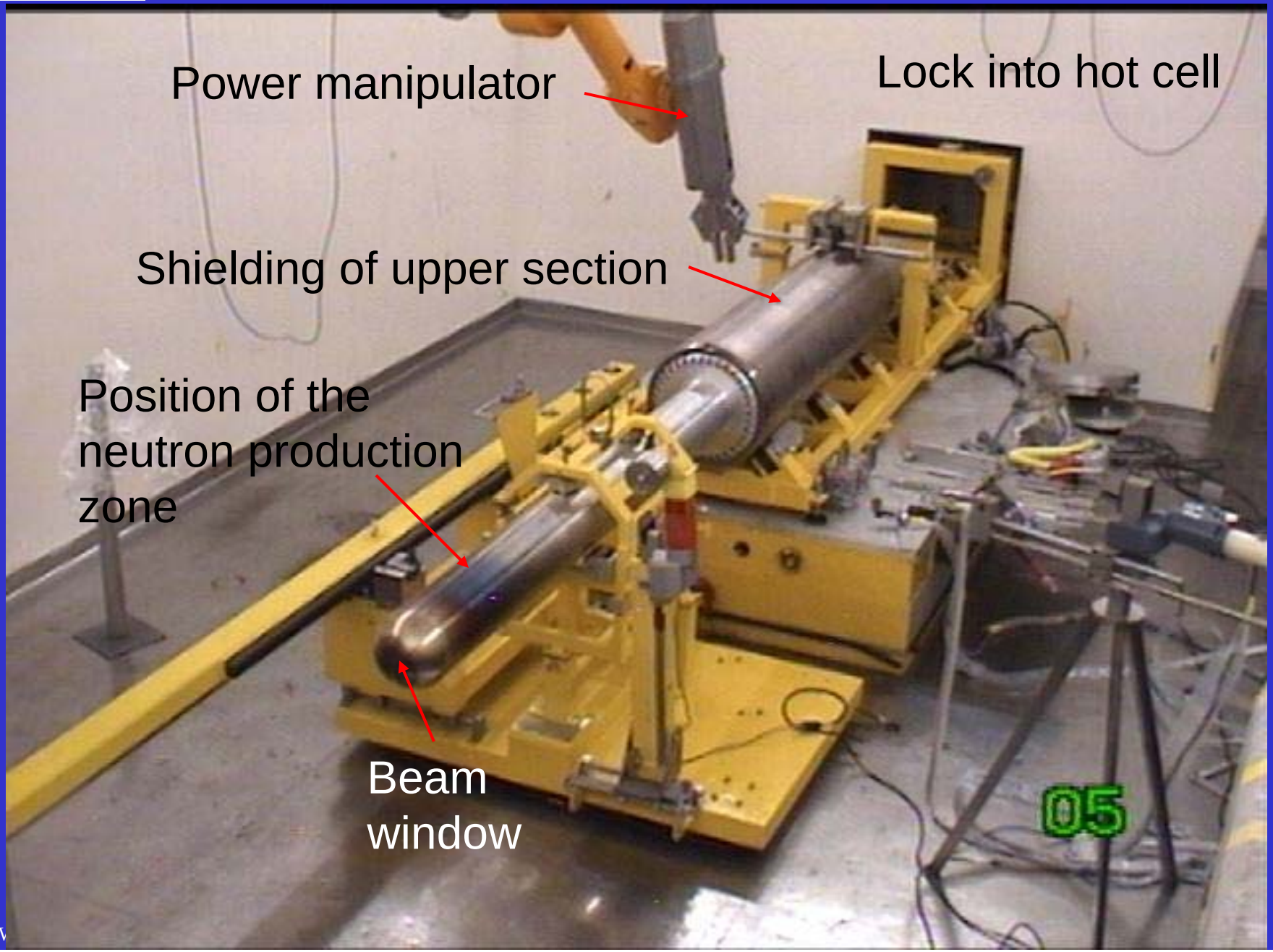
New Target in Storage Position without Cover



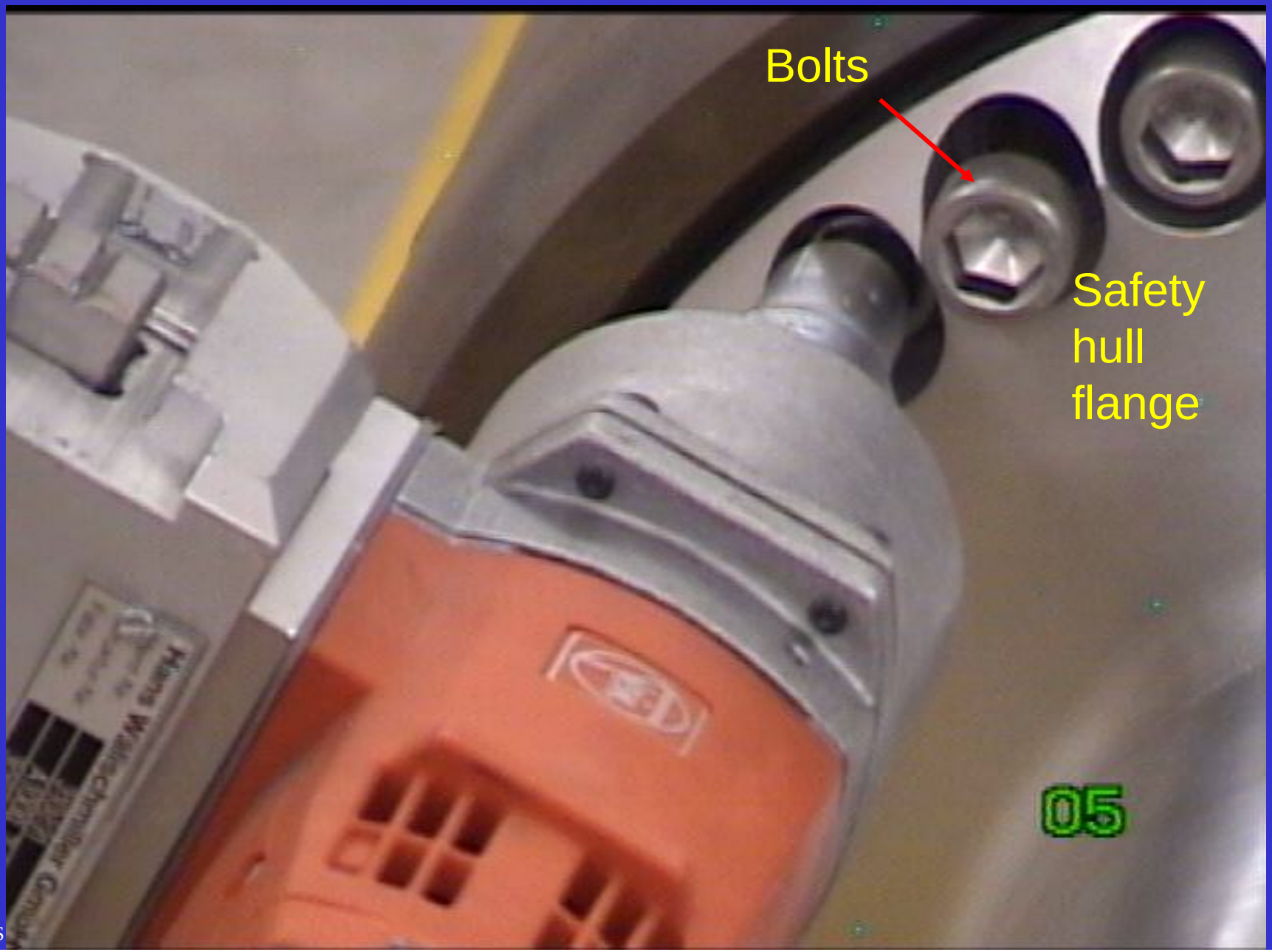
Docking of the Target Exchange Flask to the Lock of the Hot Cell in horizontal Position



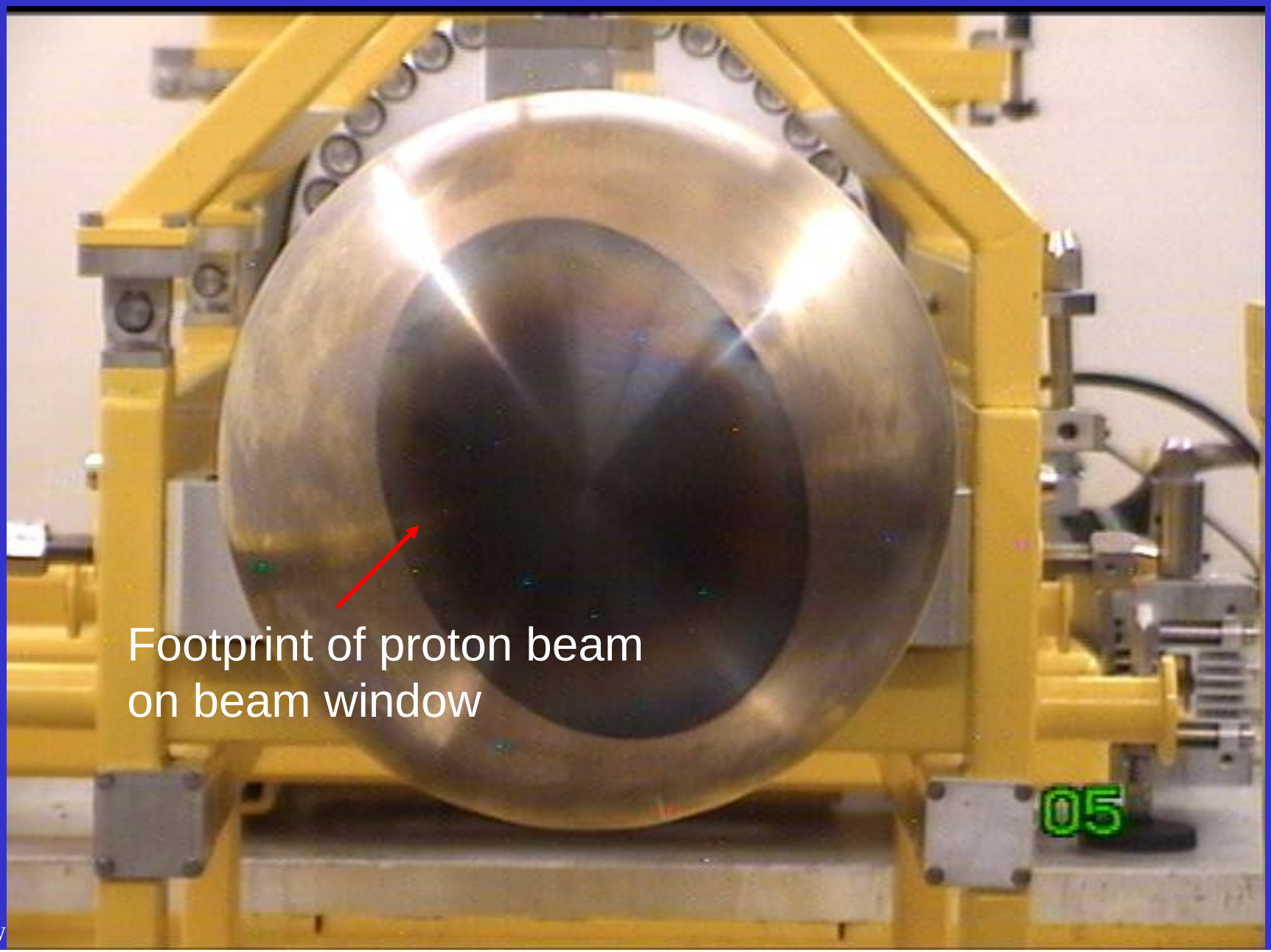
Transfer of Target from Exchange Flask into Hot Cell



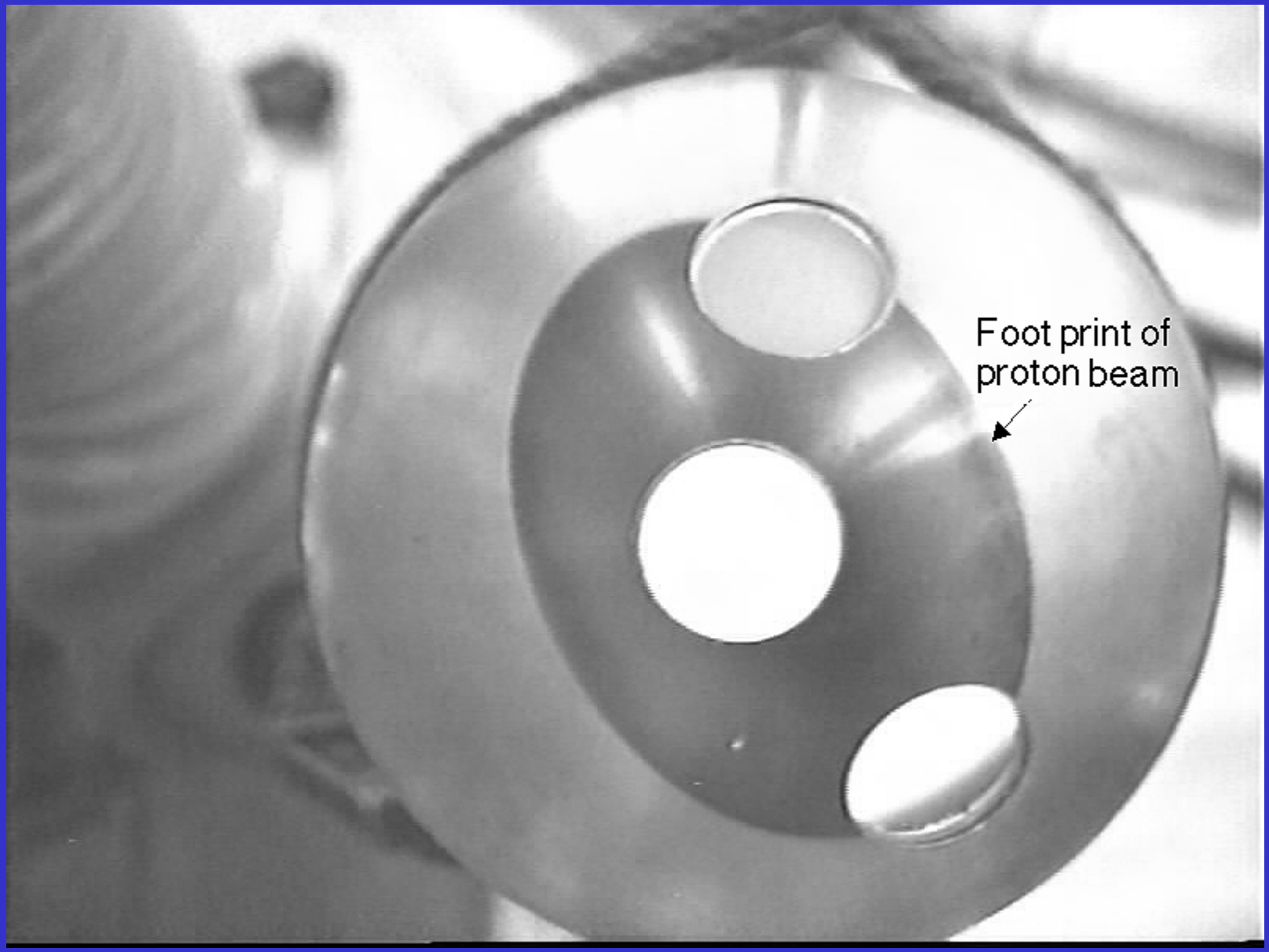
Unscrewing the Bolts of the Target Safety Hull



Footprint of Beam on Beam Window of Safety Hull

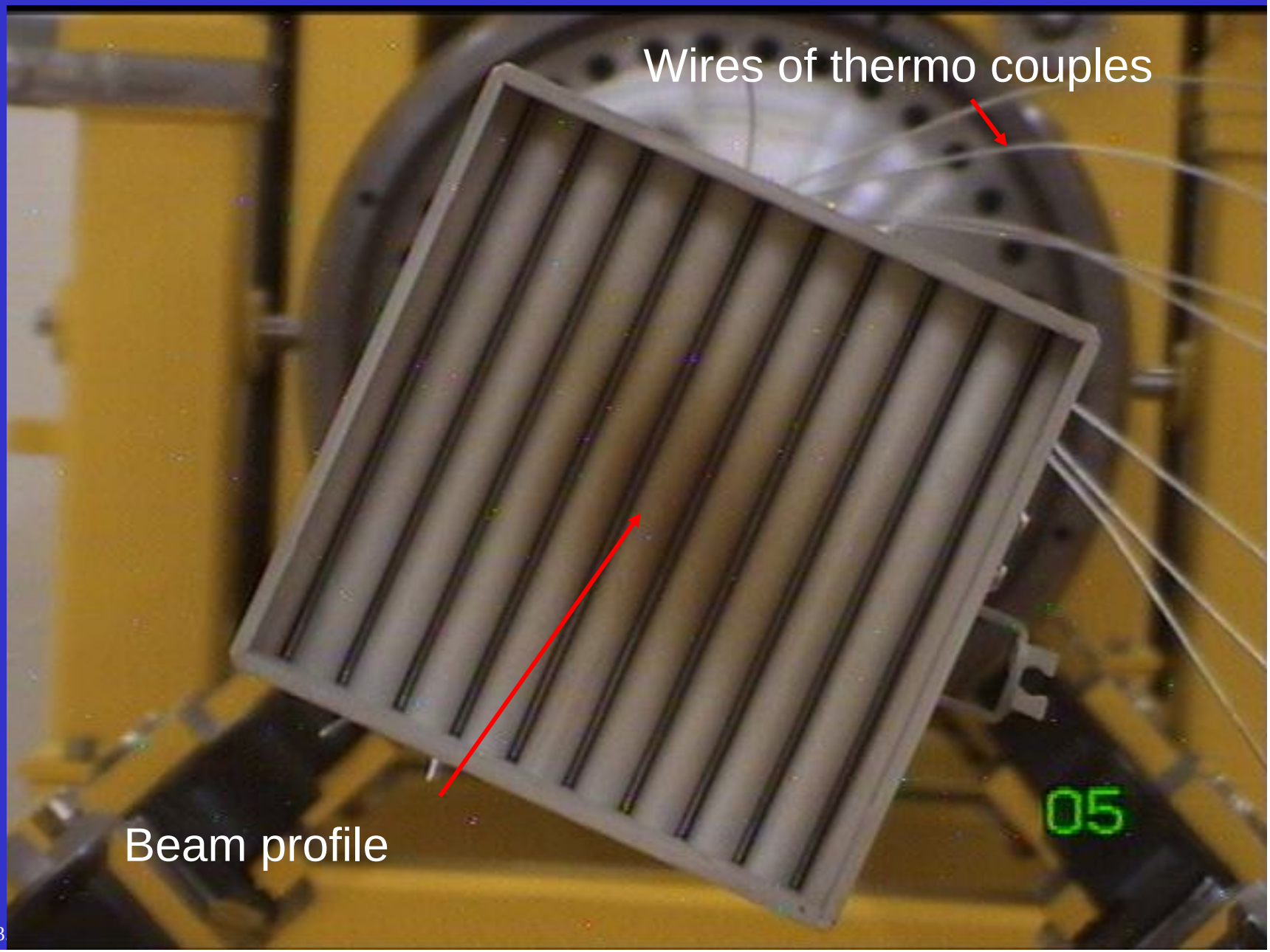


Window of Target Hull with Samples taken



Removal of Target Safety Hull

Profile of Beam on the Mark III Target Front Side



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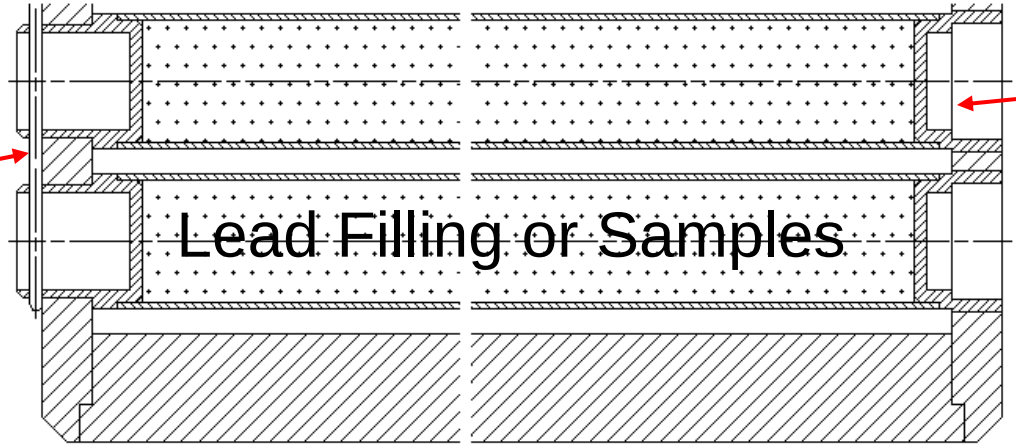
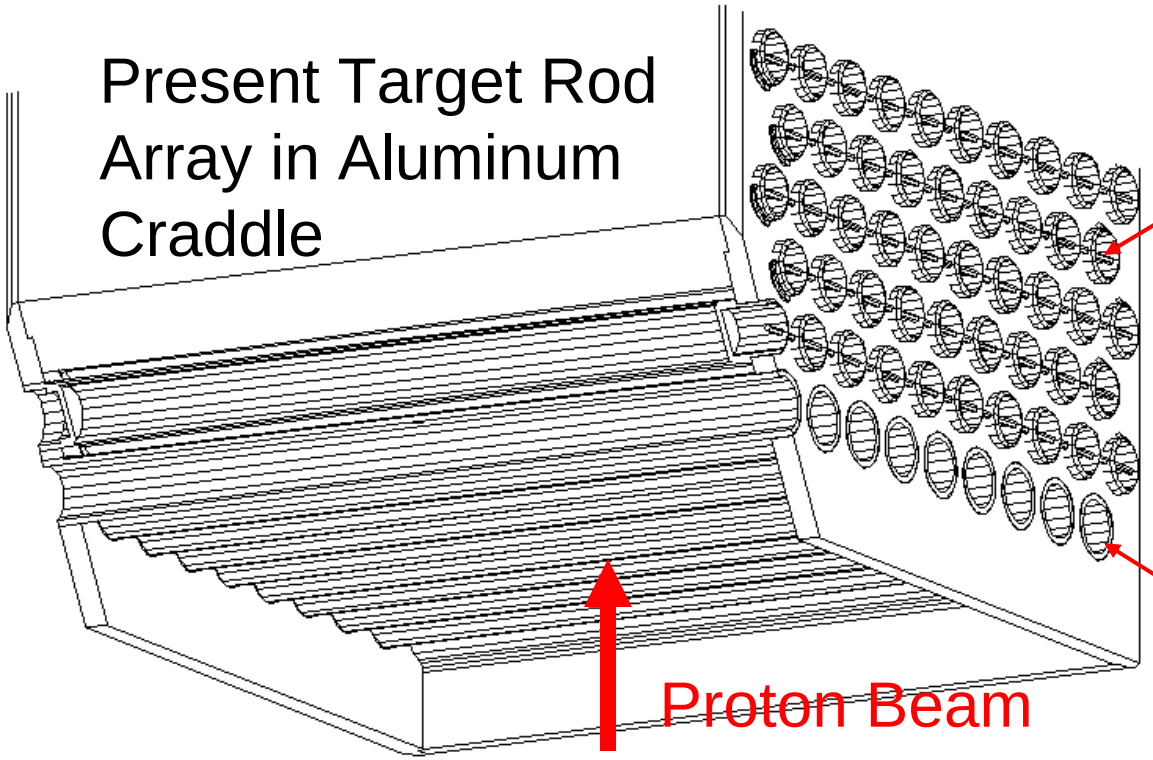
Securing Wires are cut before rod is pushed out of the craddle



End caps are welded to canning

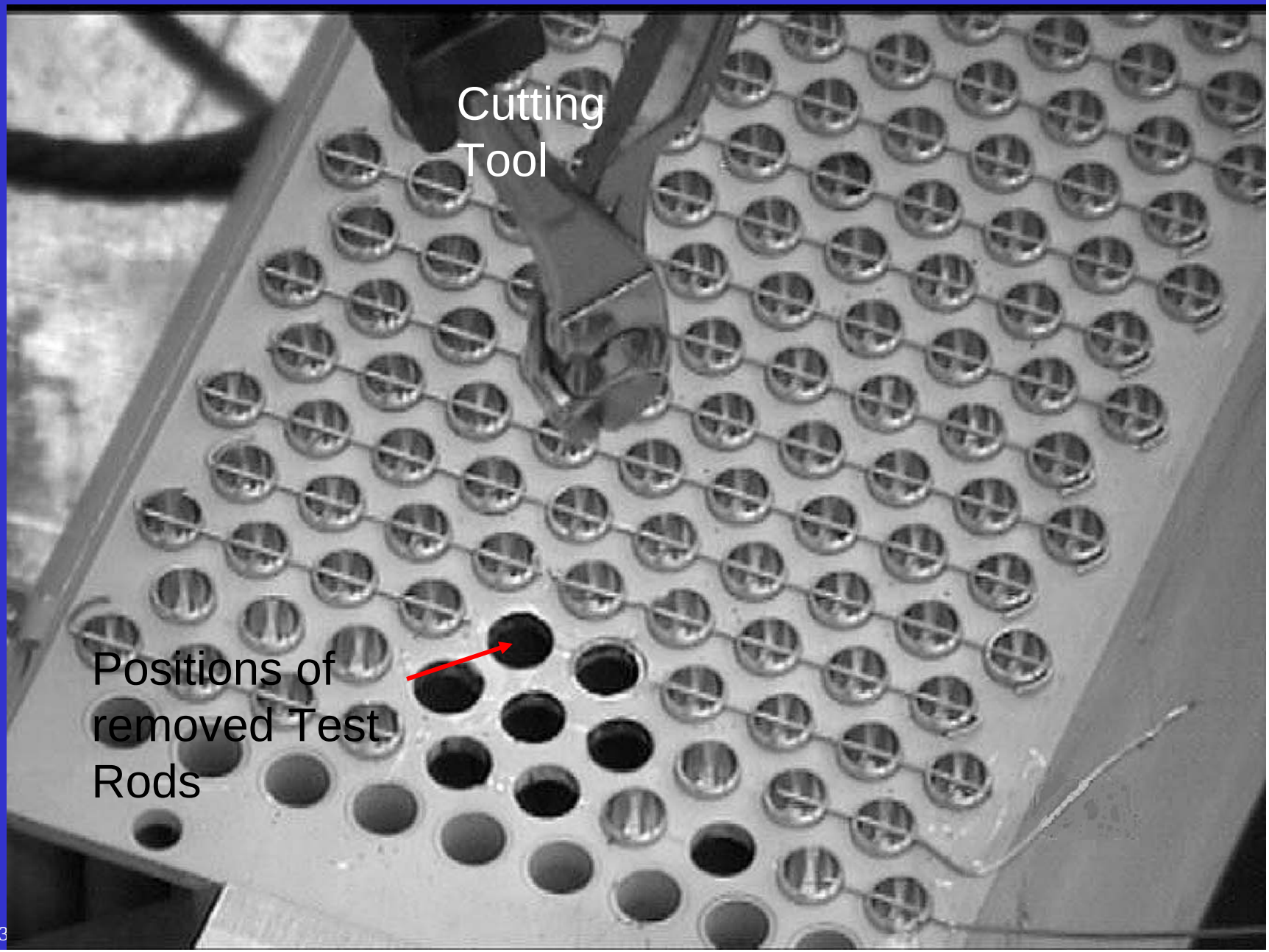
Present Target Rod Array in Aluminum Craddle



Target rods secured with Wires

Empty tubes

Cutting Wires to recover Test Rods from Target



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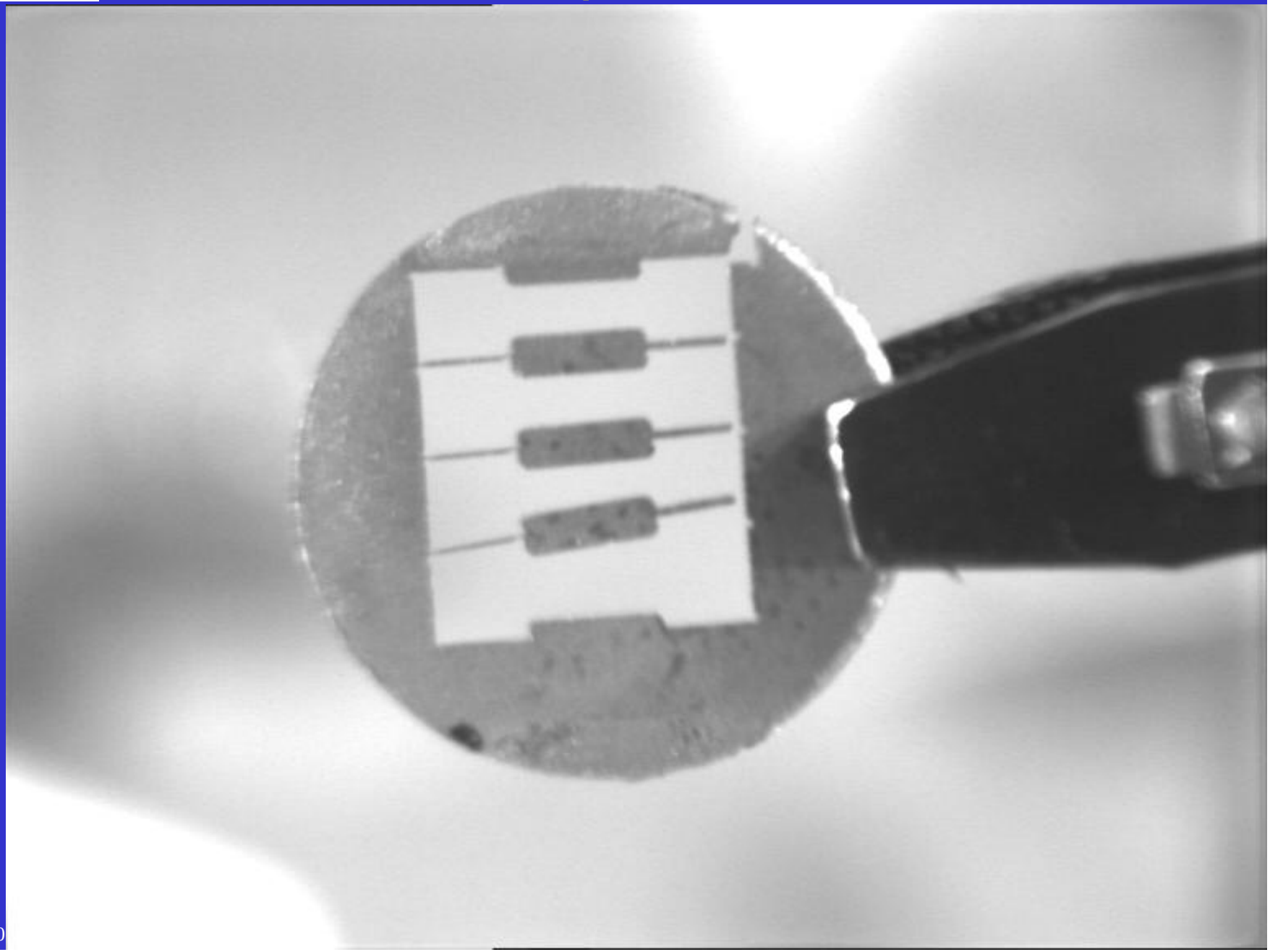
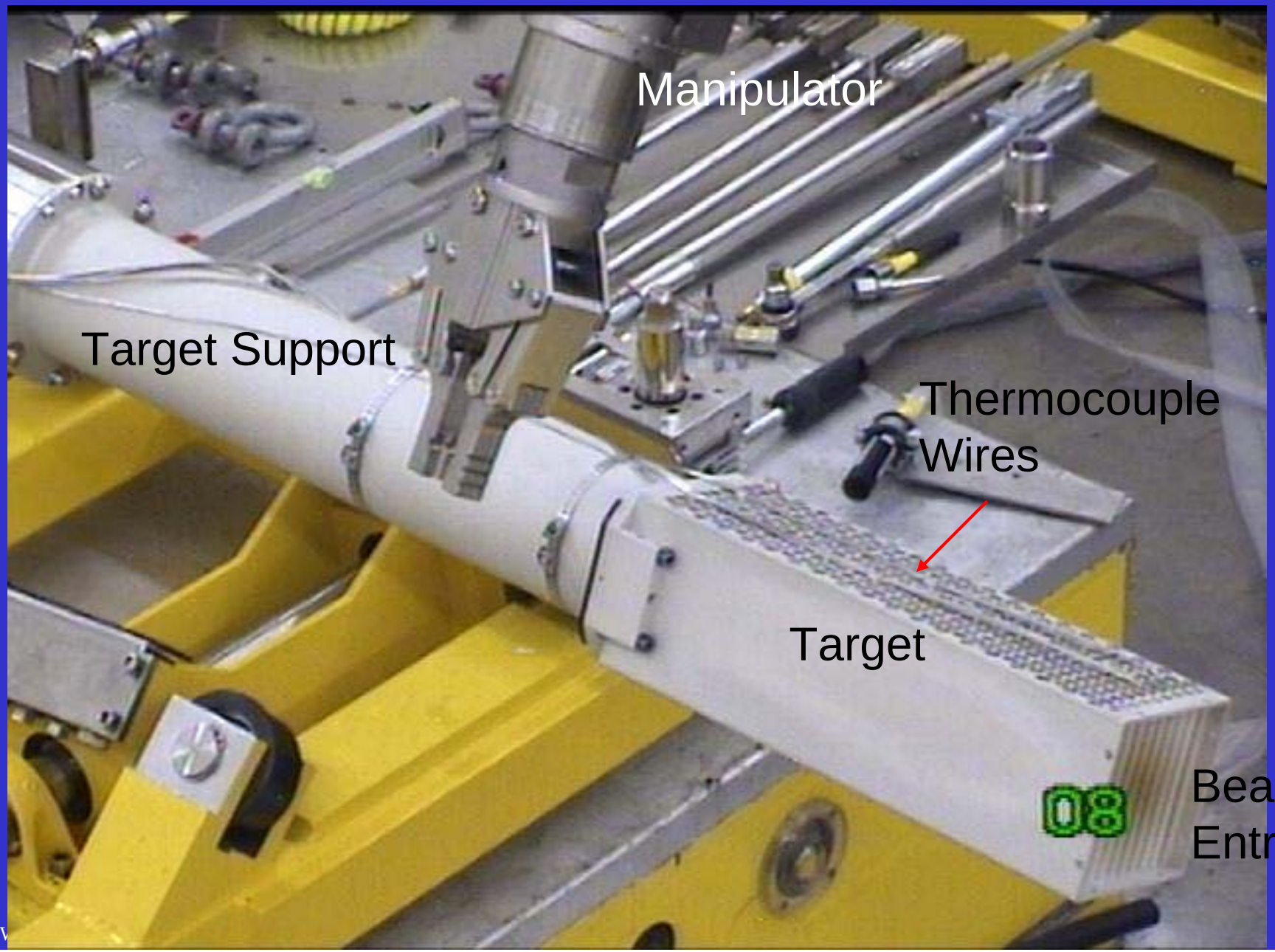
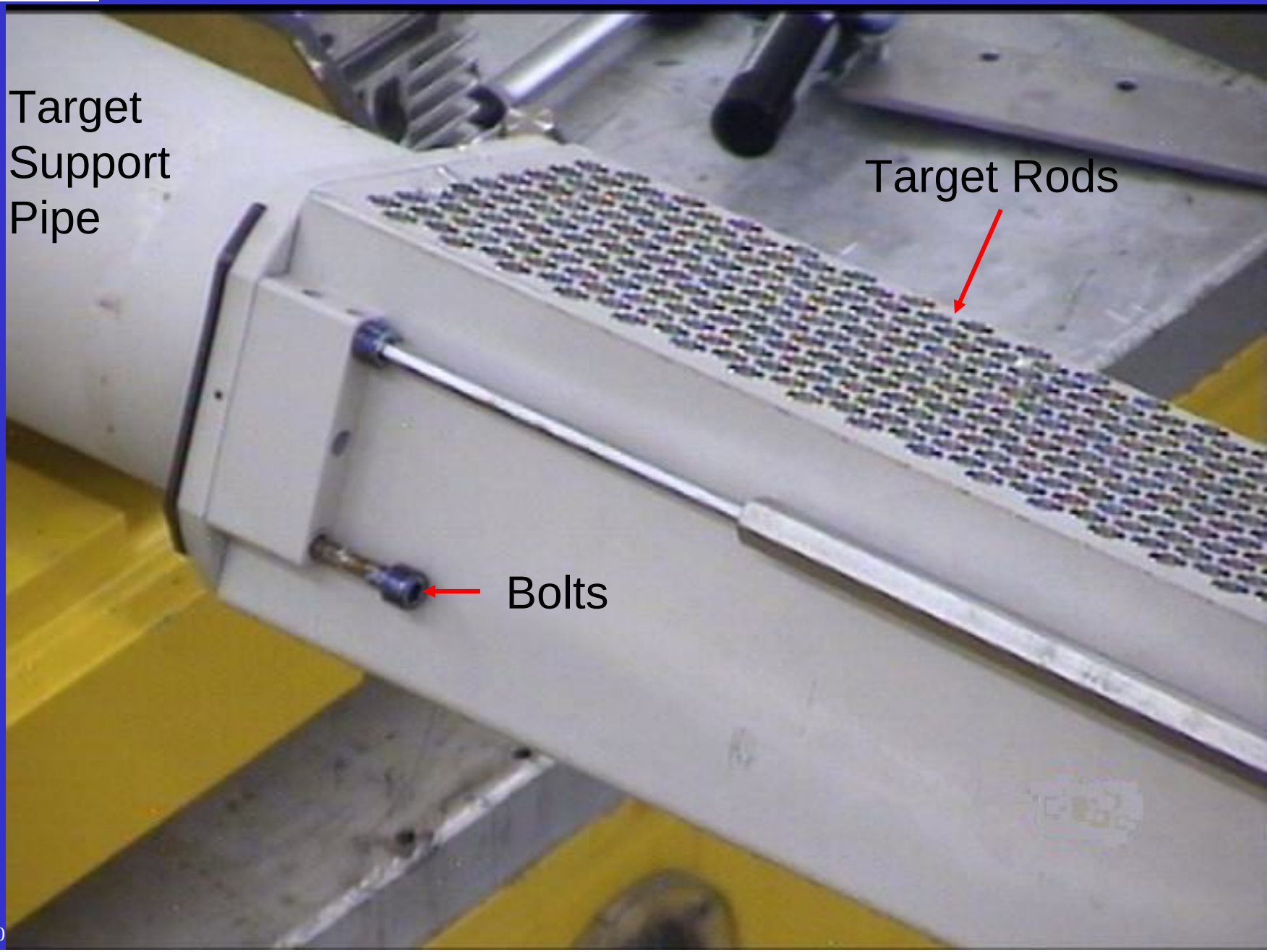
Miniature Samples from a Test Rod



Disconnecting Wires of Target Instrumentation



Removal of Bolts to disconnect Target from Support



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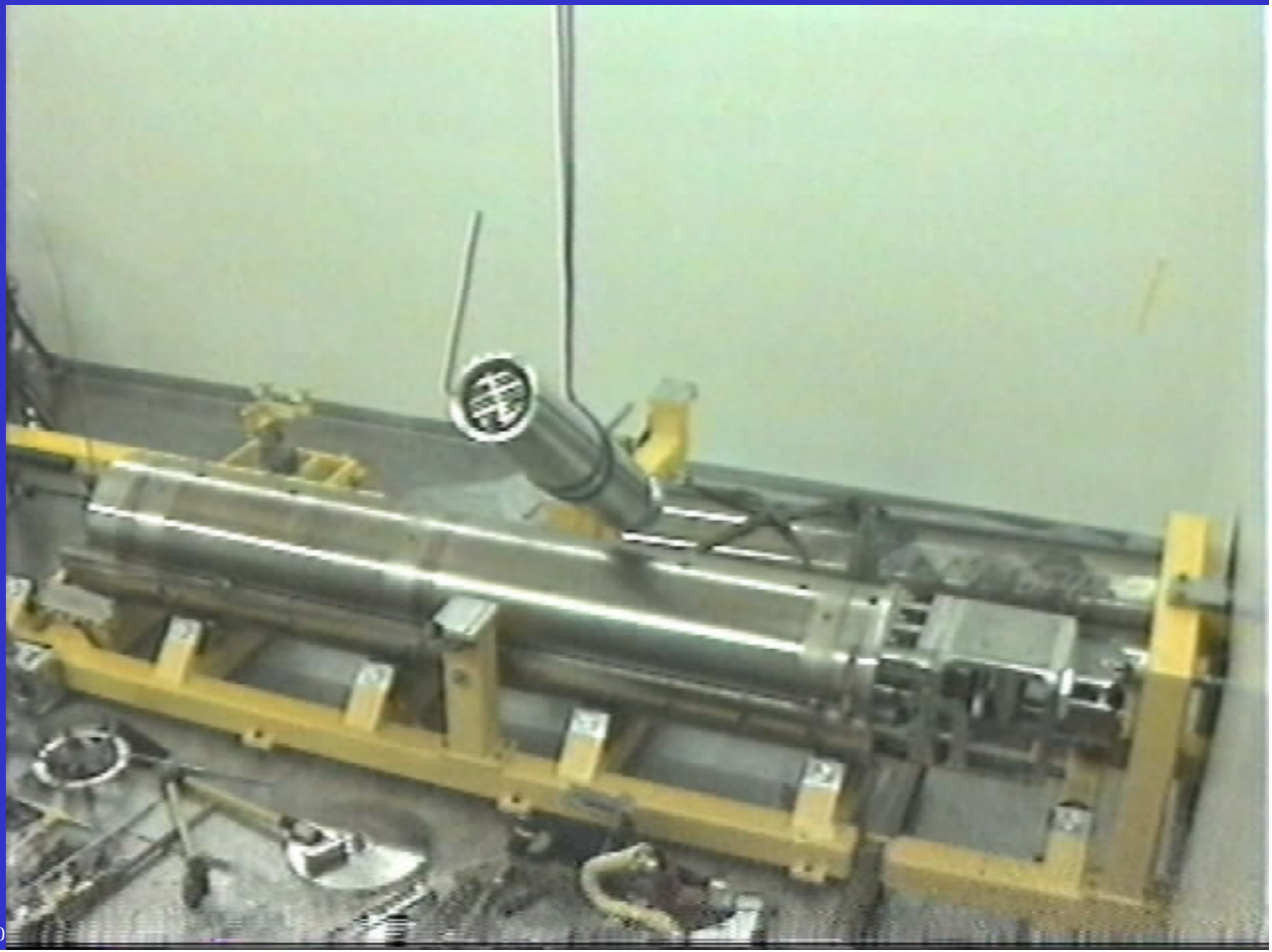
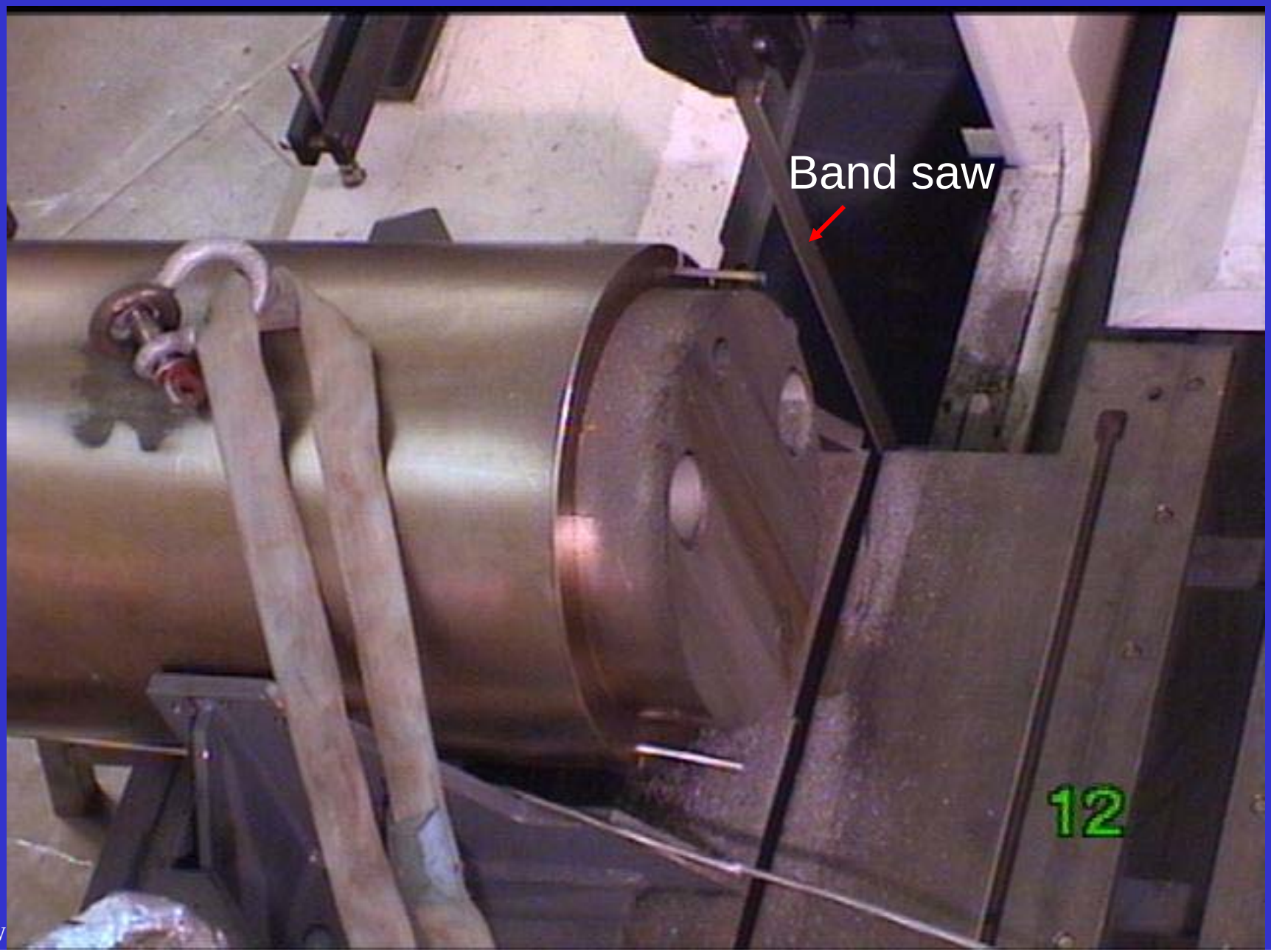
Disconnecting the Target from Support Pipe

Cut away of Beam Window from Safety Hull

Dismantling of the of Target Shielding Plug



Cutting the upper Part of the Target Shielding



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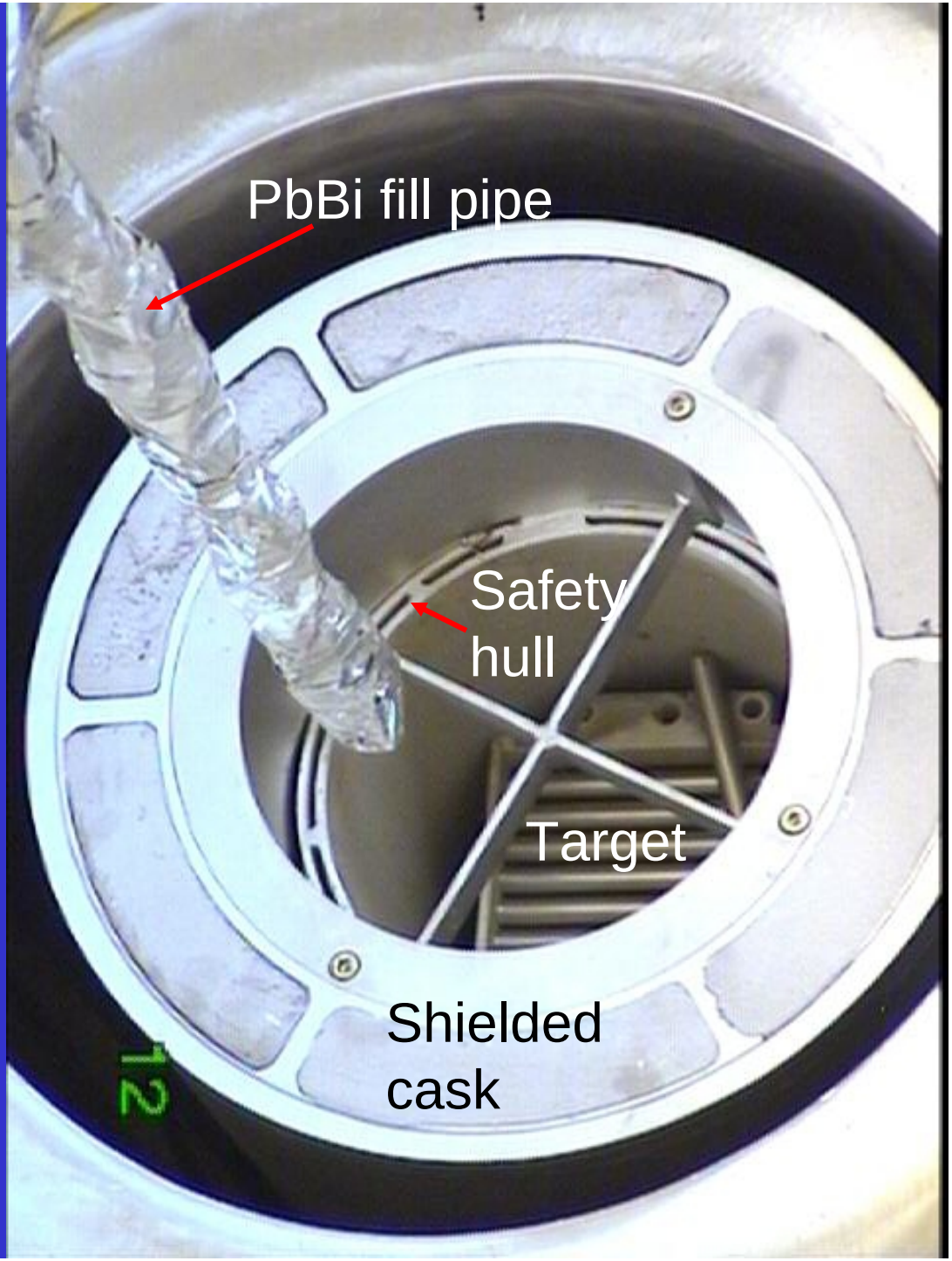
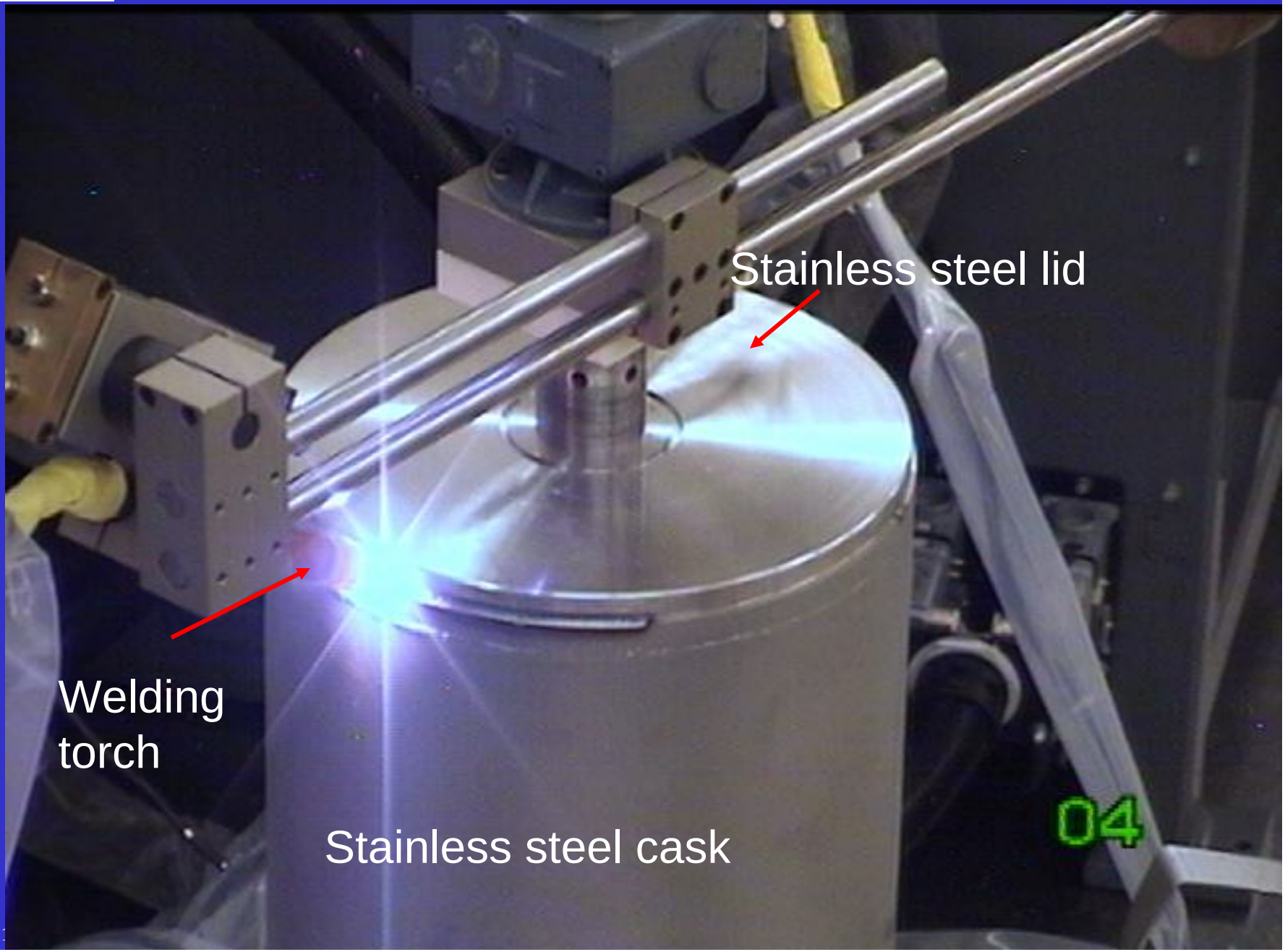
Filling the shielded cask for target disposal with liquid lead bismuth



Welding Lid of shielded Cask for Target Disposal



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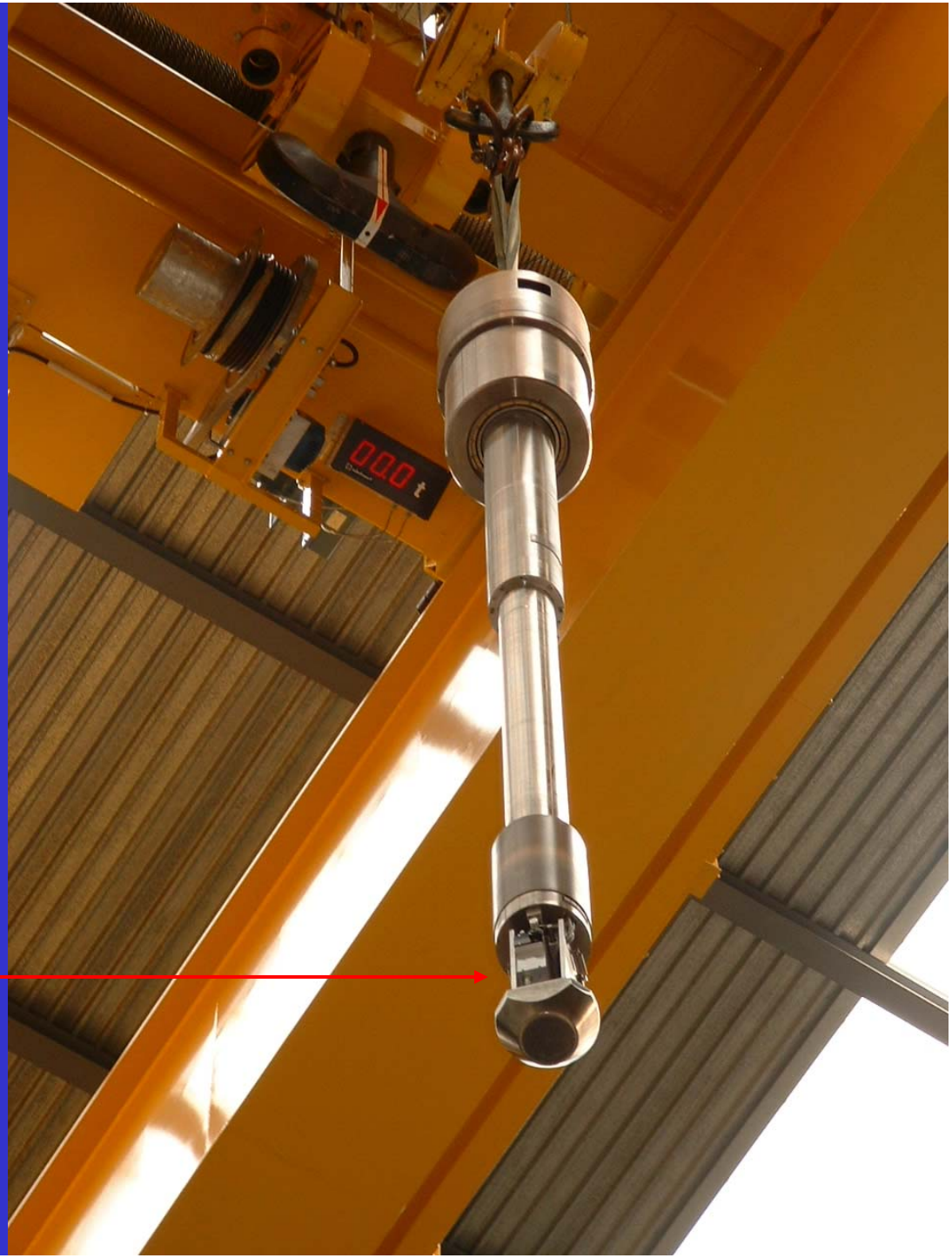
Central Tube Embrittlement Monitor moved by the Crane into the Target Head Room

Measuring head



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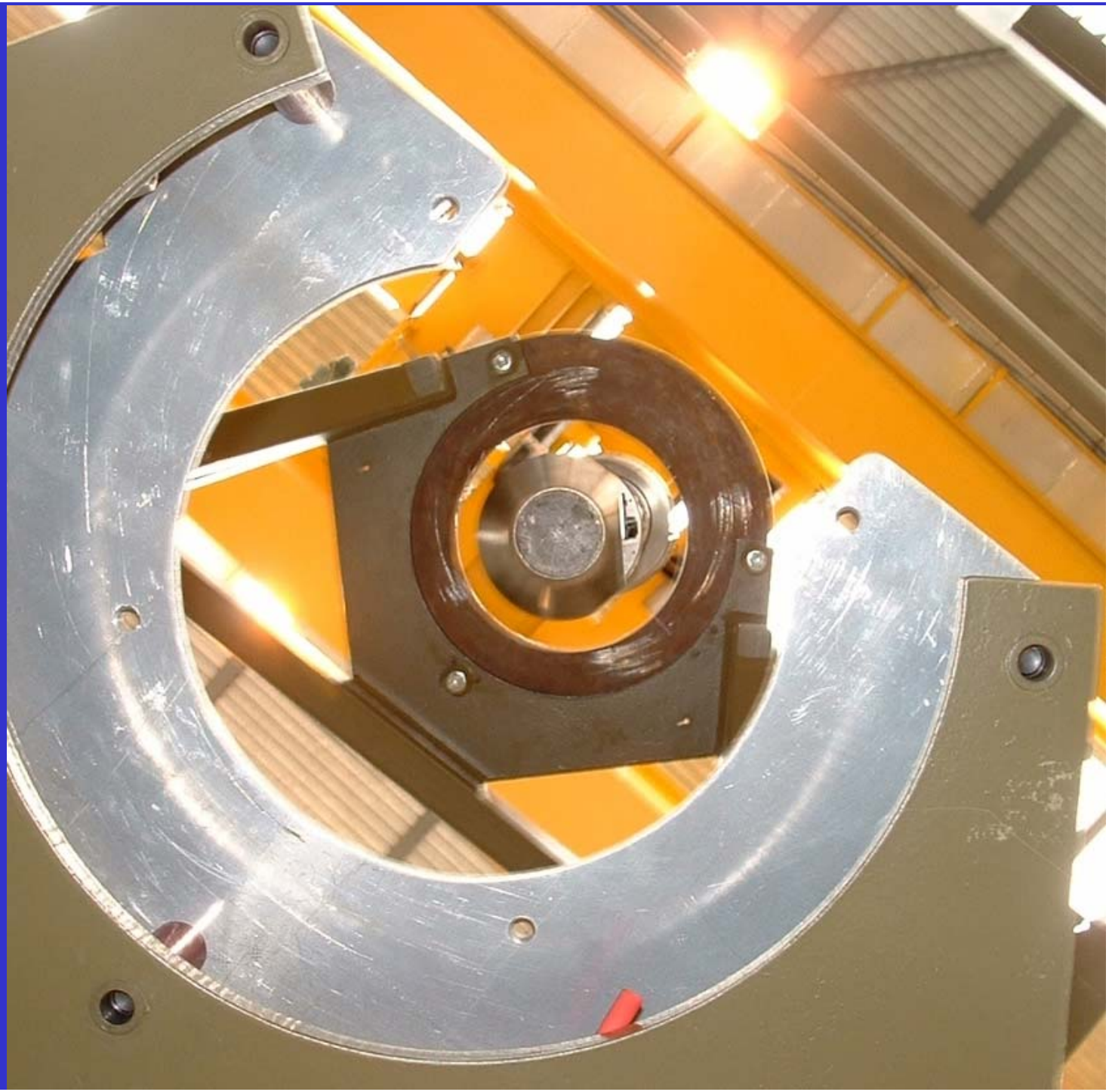
Central tube Embrittlement monitor from below



Installation of a new cold moderator

Shielding box not installed

Zur Anzeige wird der QuickTime™ Dekompressor „TIFF (LZW)" benötigt.

Trolley

Rails

Laffette

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Shielded Filters are moved manually by air cushions

Zur Anzeige wird der QuickTime™ Dekompressor „TIFF (LZW)" benötigt.

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8 Years of successful SINQ operation