



# Universal Connection System - UCON

26 January 2012

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Product Responsible – Connection Systems

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# UCON – The story

- 2007 FMC starts looking at a simplified tie-in system under the joint Statoil/FMC MMX project
- Installation procedure was to be the driver for the design – user friendly
- First concept prototypes were tested in 2009 (UCON-H and UCON-V)
- Several workshops were performed with Installation contractors – input from the user



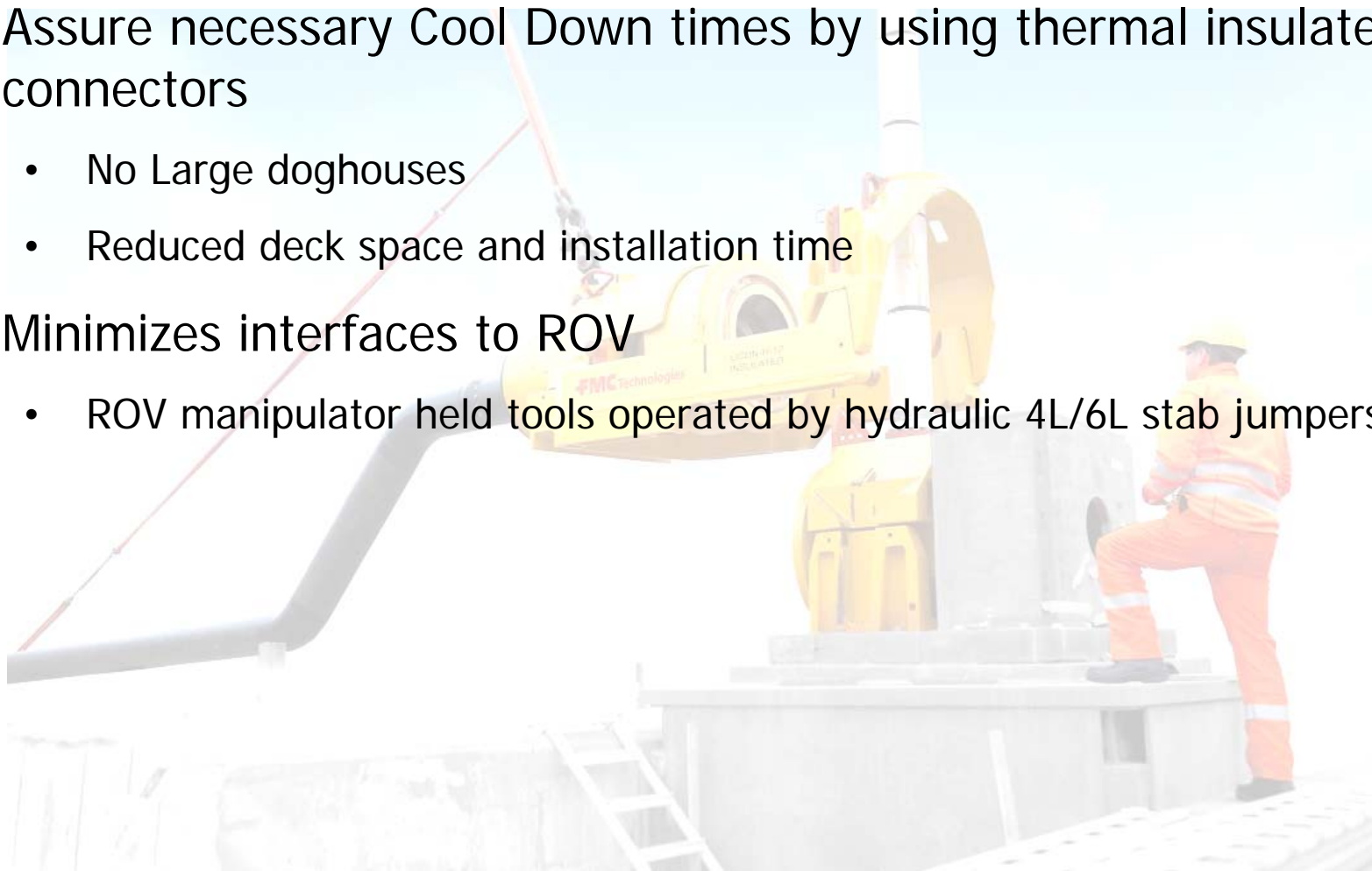
# What can UCON do for you?

- Stroke-in and connect
  - Rigid Spools (mono/multi bore)
  - Flexible lines / umbilicals
  - Pig Launchers /Receivers
  - Pig Loops



# What can UCON do for you?

- Assure necessary Cool Down times by using thermal insulated connectors
  - No Large doghouses
  - Reduced deck space and installation time
- Minimizes interfaces to ROV
  - ROV manipulator held tools operated by hydraulic 4L/6L stab jumpers



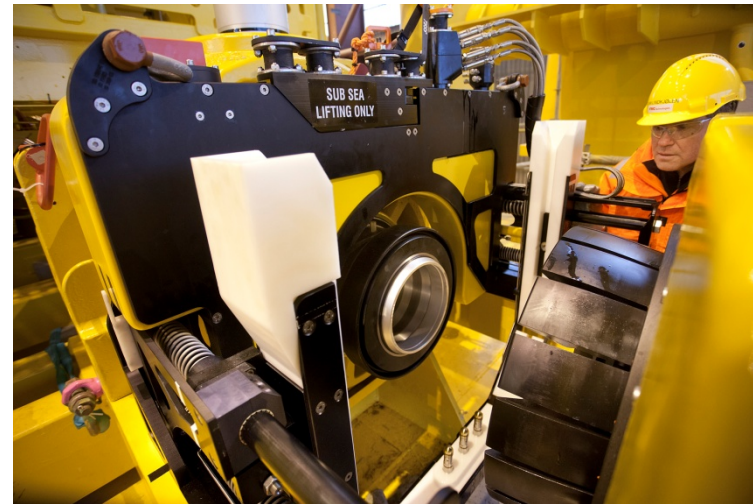
# UCON – Main features

- Basic ROV manipulator held tooling
- Utilizes the **standard** field proven KC connectors and KX gaskets
  - Mono and multibore
  - Insulated and non insulated
  - Horizontal or Vertical



# UCON – Main features

- Stroke back for contingency operations
  - Hub cleaning
  - Seal replacement



- Parking functionality available
  - Parking of sealine on foundation for module retrieval

# UCON – Main features

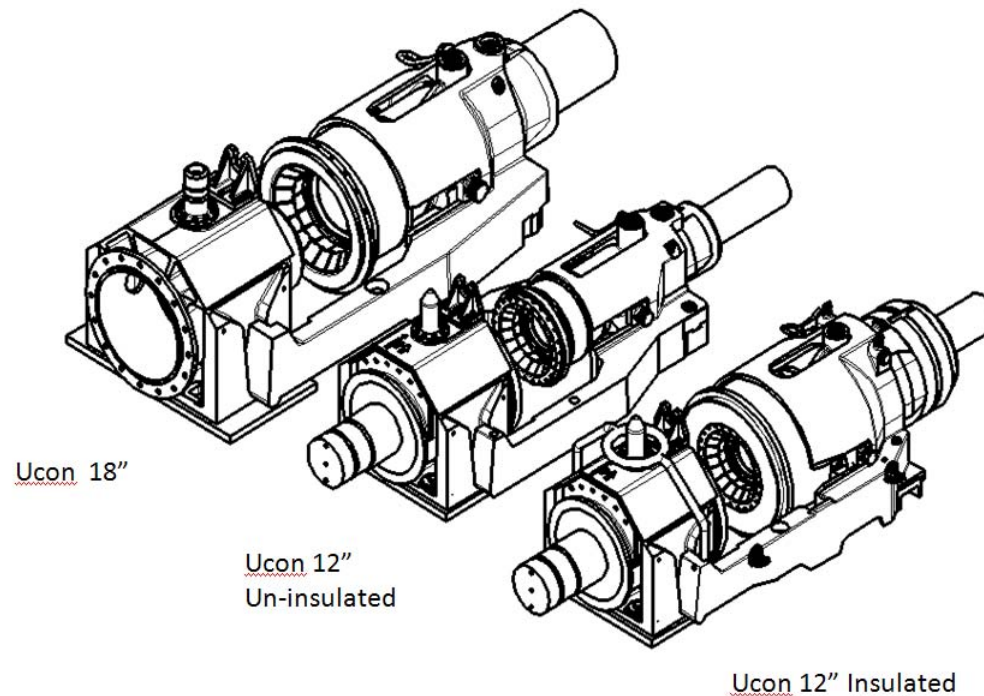
- The simplicity of the UCON-H ROV tools strongly reduces the
  - Cost and time of maintenance/refurbishment
  - Risk of tool down time
  - Expertise needed to operate them



# UCON – Connection System

- Easy scalable
  - Easily adapted to the range of connector sizes and insulation requirements.

Ucon 18", 12" insulated and un-insulated system





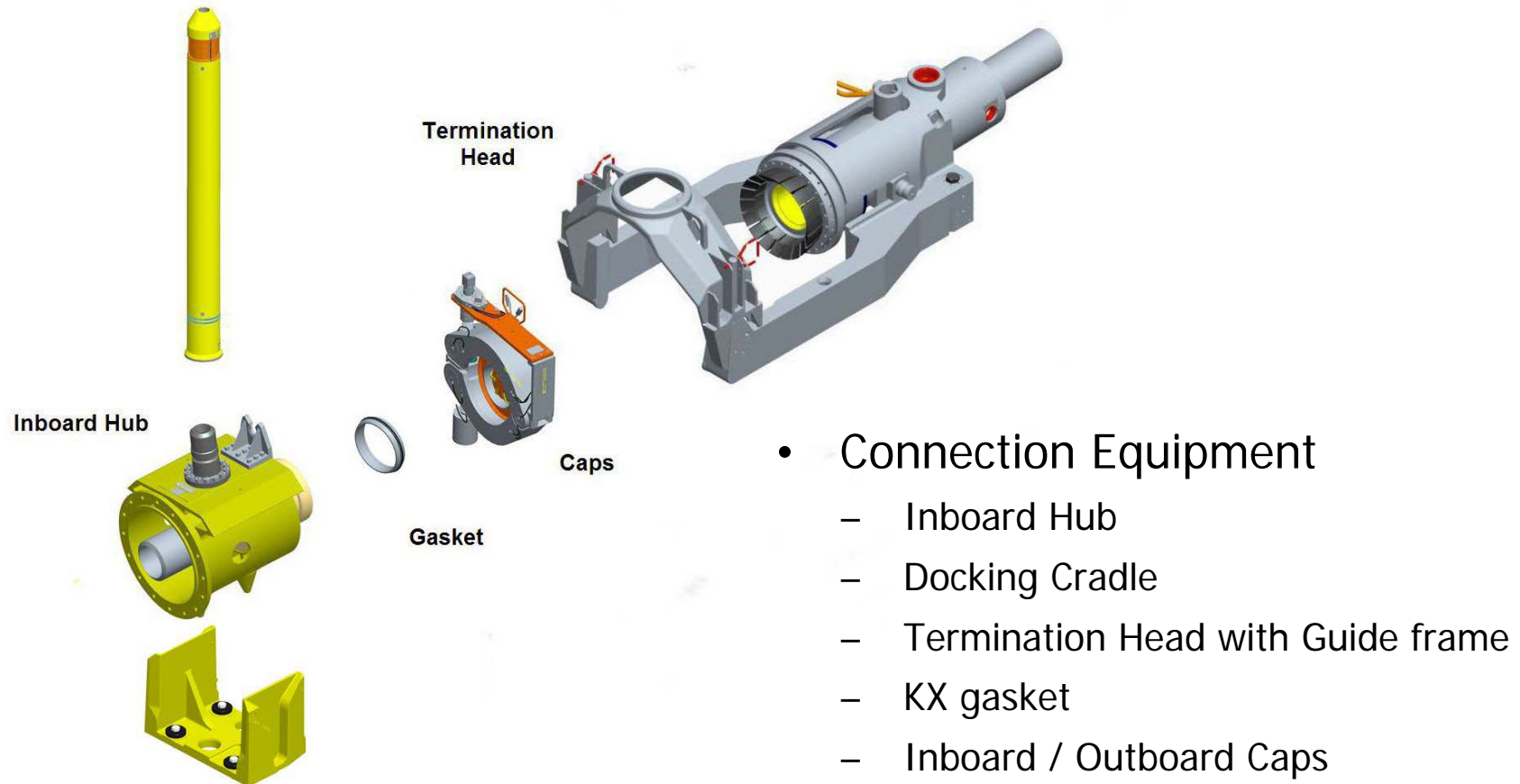
# UCON-H System overview

	UCON-H-12		UCON-H-12 Insulated		UCON-H-18			UCON-H-18 Insulated		
Connector	KC4.2-10 *	KC4.2-12	KC4.2-10 *	KC4.2-12	KC4.2-14 *	KC4.2-16 *	KC4.2-18	KC4.2-14	KC4.2-16	KC4.2-18
Max NPS	12.75	14	12.75	14	16	18	20	16	18	20
Insulation	U-value	U-value	6+	6	U-value	U-value	U-value	8	6	4
Guiding structure	-12		-12 Ins		-18			-18 Ins		
Cradle	-12		-12 Ins		-18			-18 Ins		
Hub support	-12		-12 Ins		-18			-18 Ins		
Stroking Tool	SST-12				SST-18					
Connector Actuation Tool	CAT-12		CAT-12 Ins		CAT-18			CAT-18 Ins		

**Notes:**

- 1.\* Adapter between connector and carrierpipe and hub/hub support. Need to verify system capacity for smaller connector and tool in combination.
- 2.UCON-H-18 Ins – Design ongoing , i.e. Not qualified
- 3.KC4.2-14 new size to be qualified

# UCON-H connection components



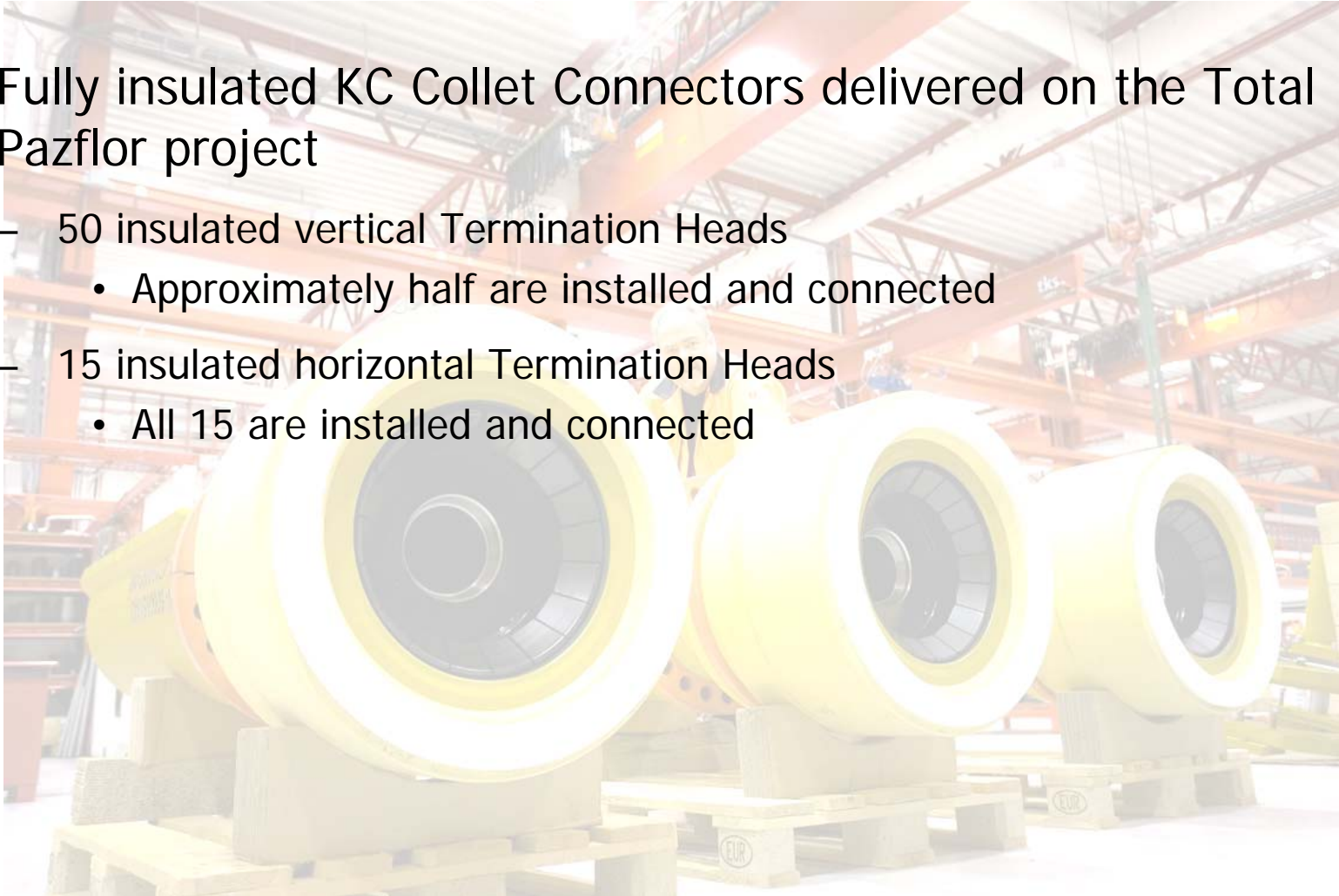
# The UCON-H Connection



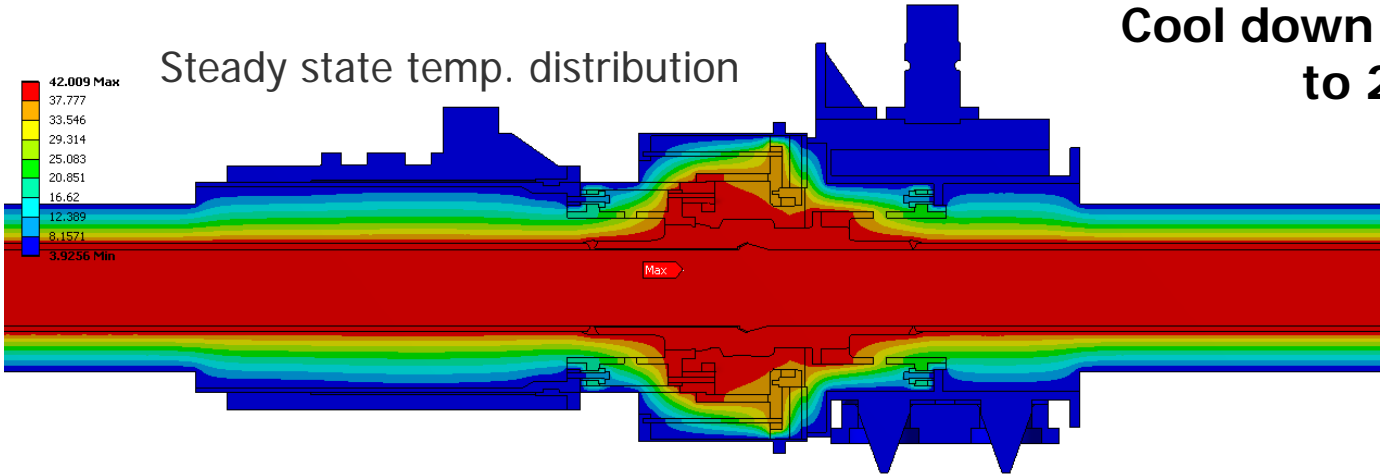
- Termination Head
- Inboard Hub
- Docking Cradle

# Insulated KC Collet Connector

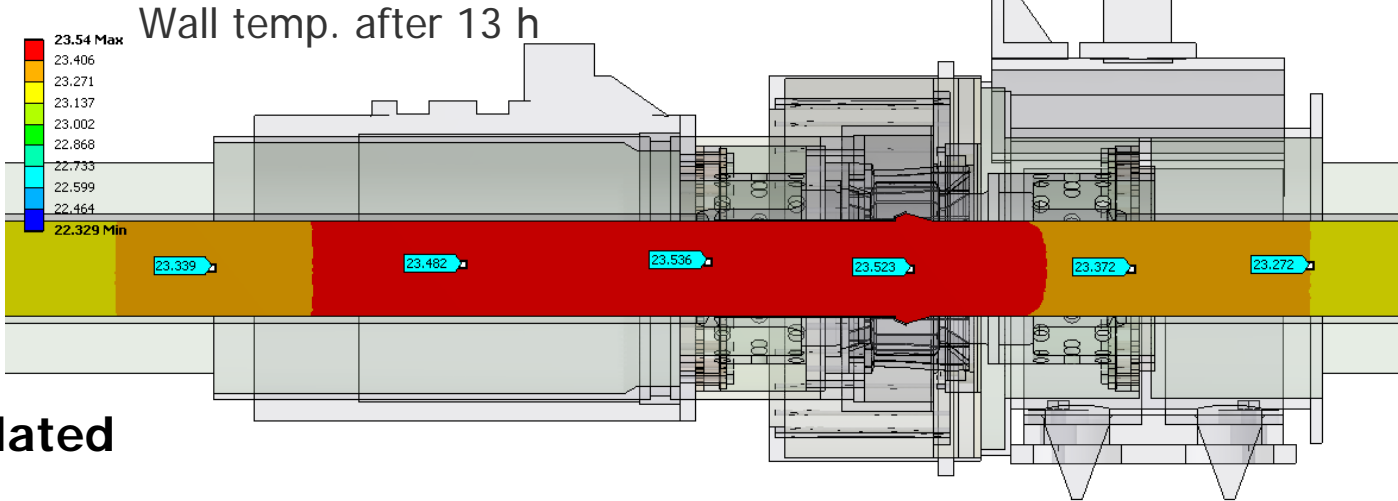
- Fully insulated KC Collet Connectors delivered on the Total Pazflor project
  - 50 insulated vertical Termination Heads
    - Approximately half are installed and connected
  - 15 insulated horizontal Termination Heads
    - All 15 are installed and connected



# UCON-H-12 Insulated - Monobore



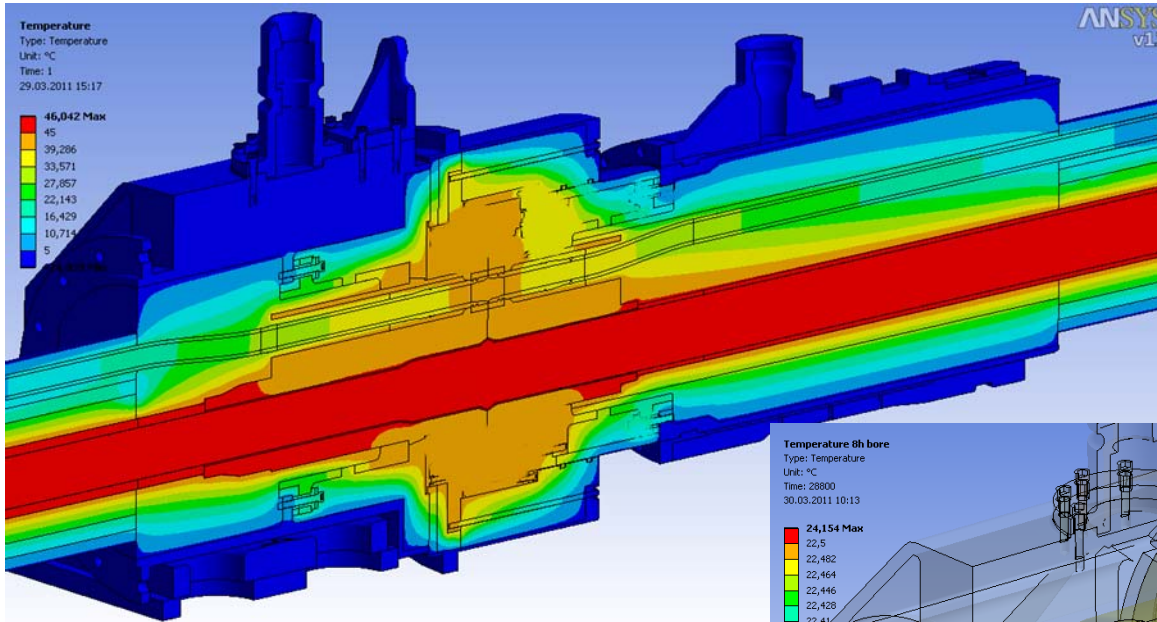
Cool down requirement: 42 to 22 °C in 13 h



KC4.2-12, ID 9, insulated

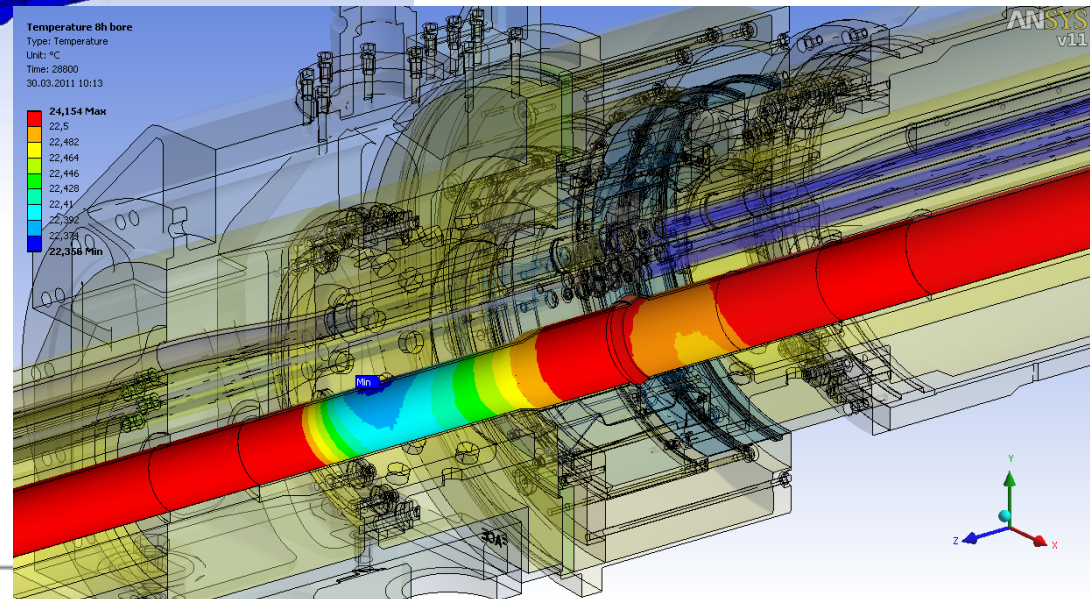
# UCON-H-12 Insulated - Multibore

Steady state temp. distribution



Cool down requirement: 46 to 22 °C in 8 h

Wall temp. after 8 h



KC4.2-12, insulated

- ID 6"
- ID 2"
- 6 Hydraulic Lines

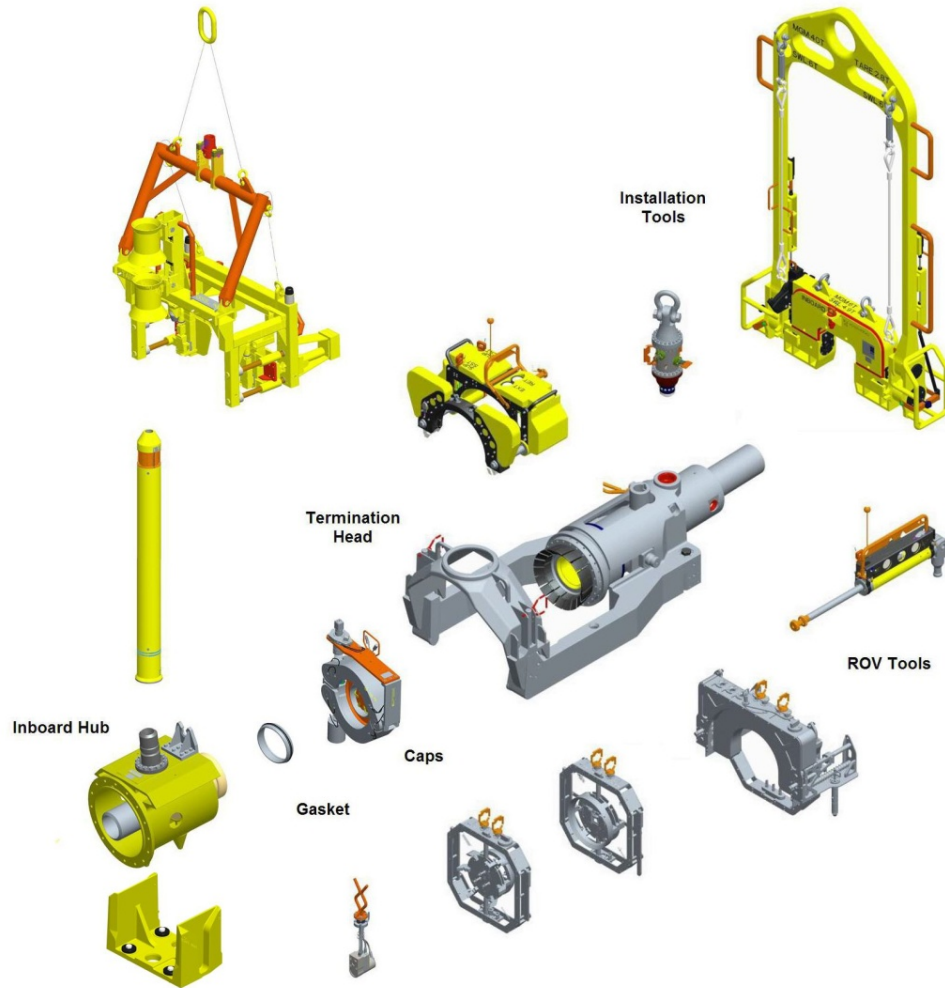


# Universal Connection System - UCON

UCON-H tools

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# UCON-H system components



- Tooling

- Connector actuator tool open/lock
- Stroking cylinder
- Hub/connector cleaning tool
- Seal replacement tool
- Tool interface frame (TIF) for hub cleaning and seal replacement tool
- Lifting yoke/sealine lifting tool
- HP Cap Running Tool
- Inspection camera

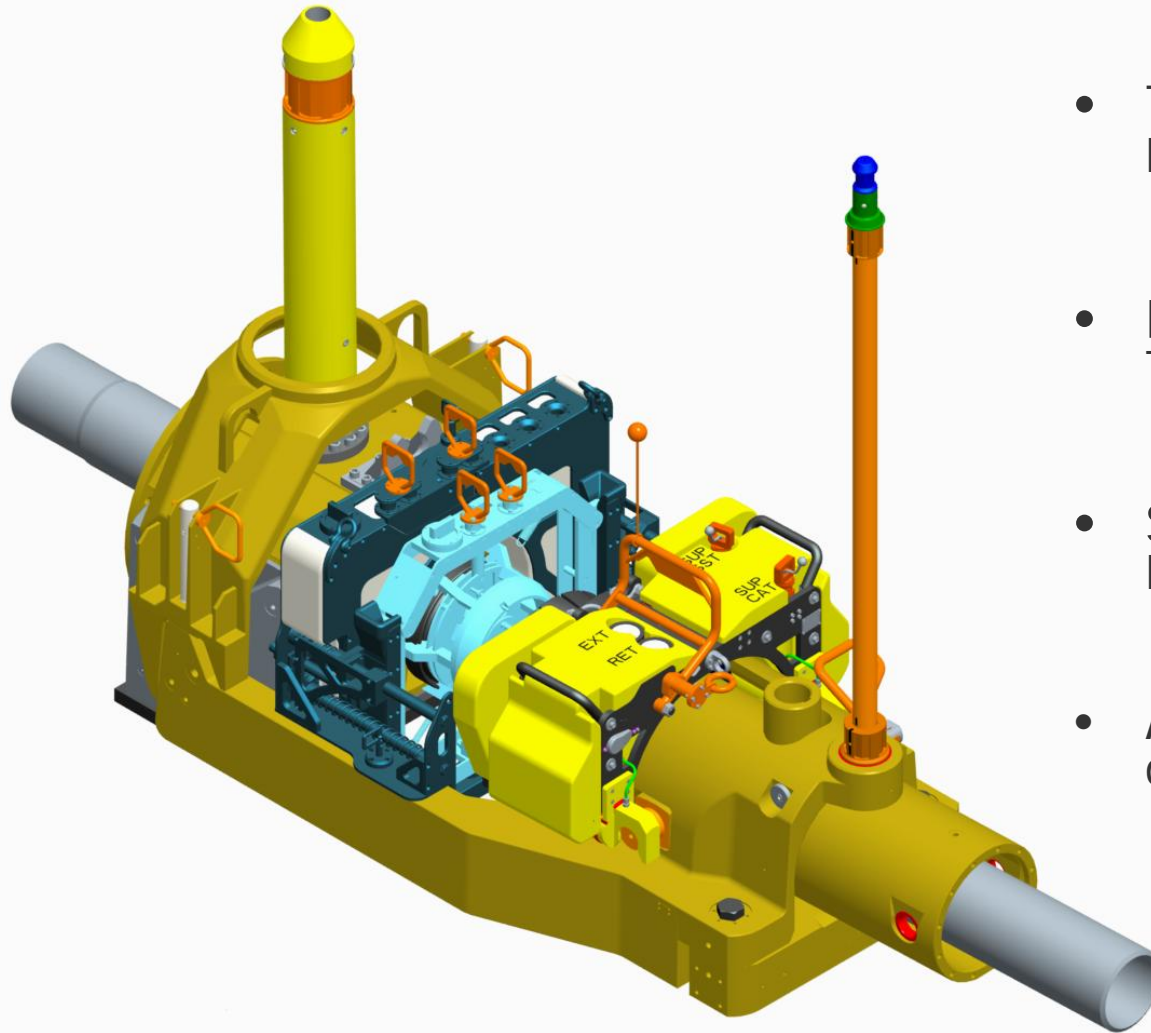


# UCON-H Main tooling

- SST – Sealine Stroking Tool
- CAT – Connector Actuation Tool

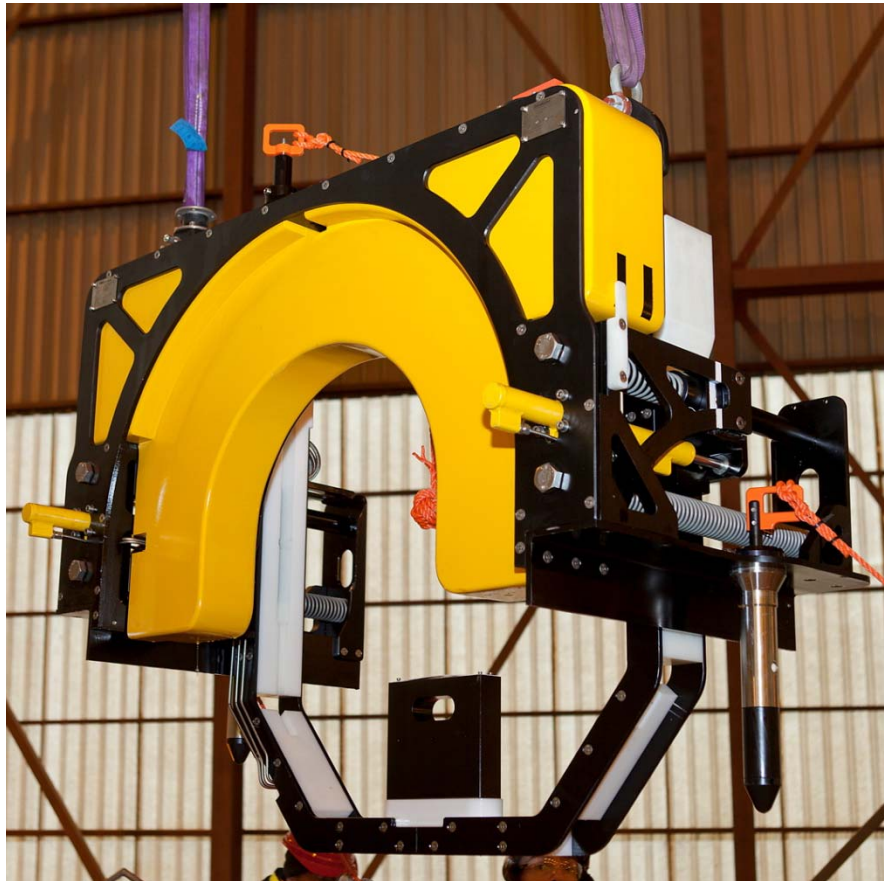


# UCON-H ROV Tools



- TIF – Tool Interface Frame
- HCT – Hub Cleaning Tool
- SRT – Seal Replacement Tool
- All ROV tools deployed in basket

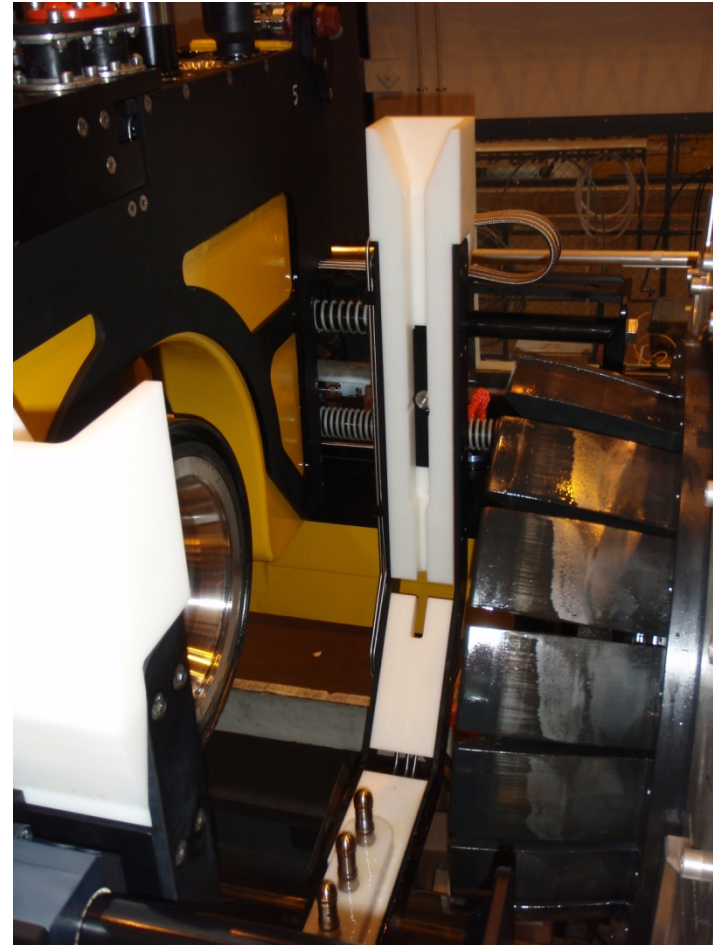
# Tool Interface Frame (TIF)



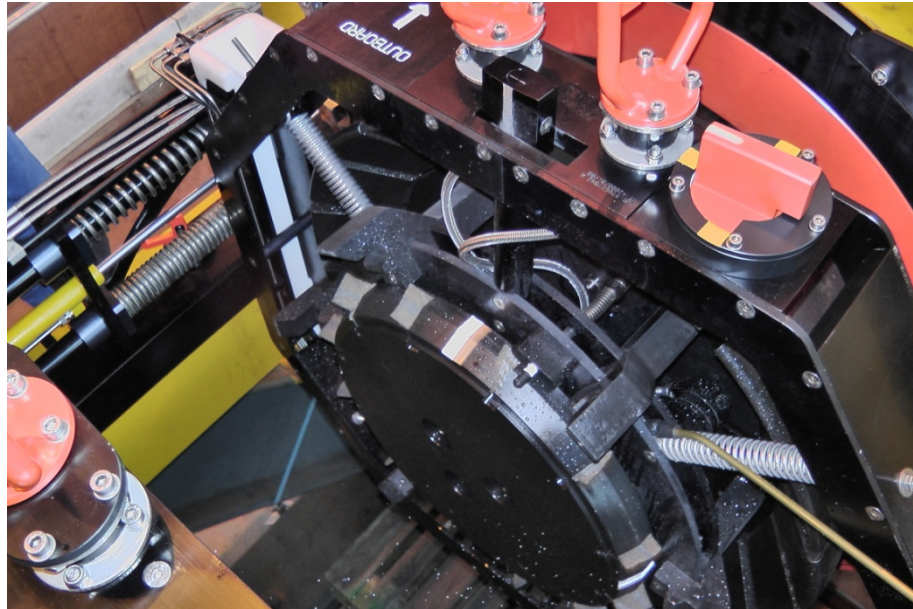
- Used to stroke the Hub Cleaning Tool (HCT) inboard / outboard
- Used to stroke the Seal Replacement Tool (SRT) inboard
- Operated with a 6L hydraulic stab

# Tool Interface Frame (TIF)

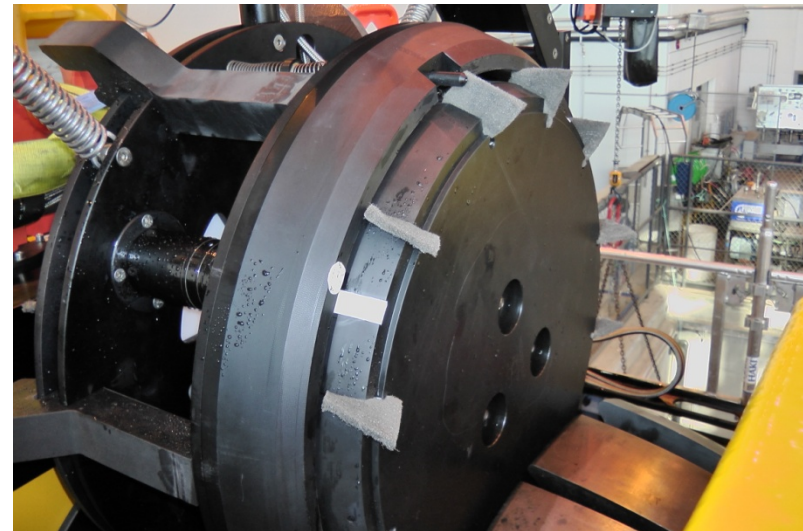
- Hydraulic power to the HCT and SRT is provide through quick connectors



# Hub Cleaning Tool (HCT)



- Combined outboard and inboard cleaning tool cassette
- Acid injection



# Seal Replacement Tool (SRT)



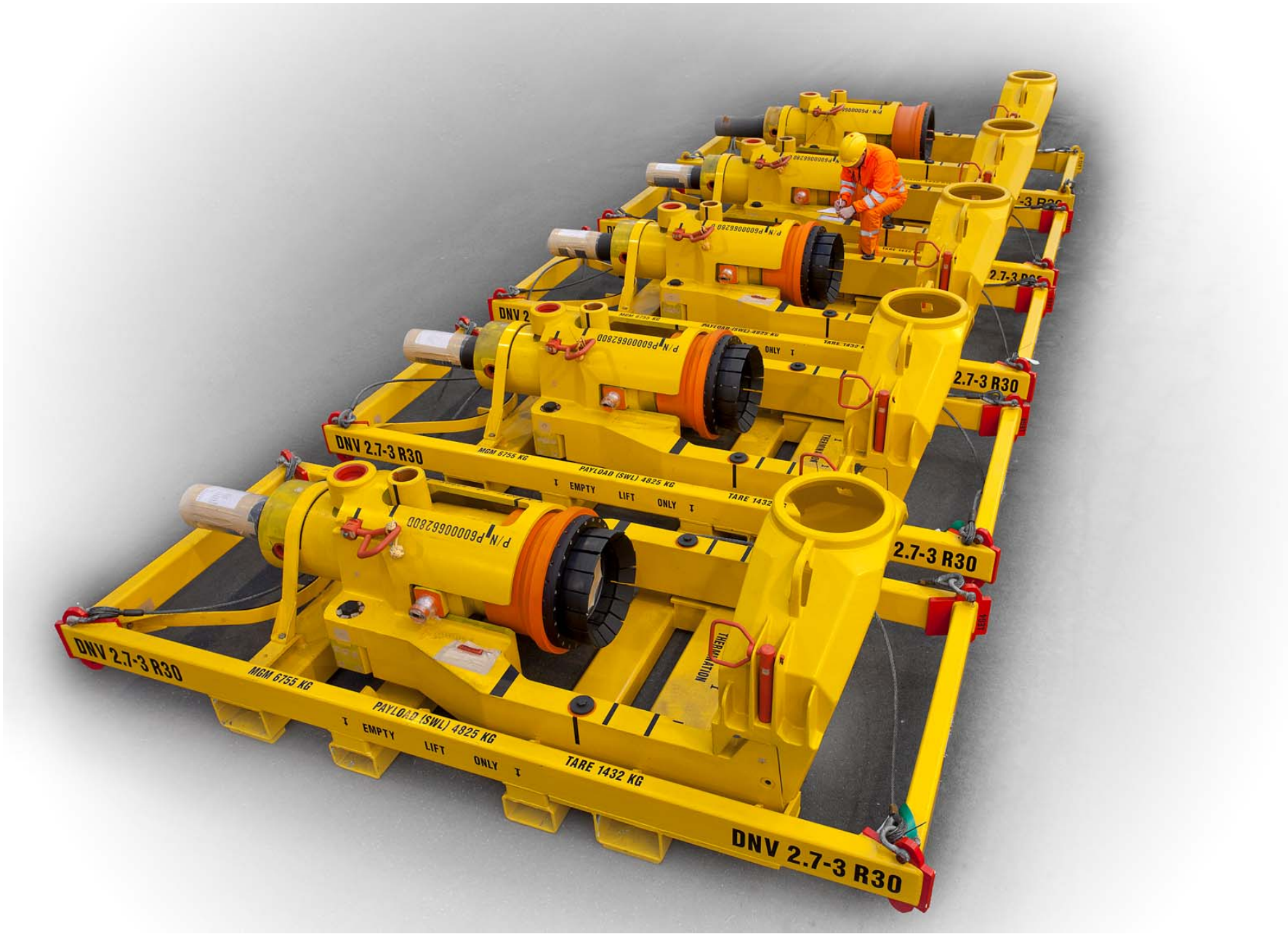
- Common tool for all KX sizes in UCON-H-12 family (6", 8", 10", 12")



# UCON-H ongoing projects

- Gazprom – Kirinskoye
- TOTAL – Laggan Tormore
- SHELL – Ormen Lange
- TOTAL – CLOV
- British Gaz – Knarr





**FMC** Technologies

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Thank you for your attention  
Any questions ?