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

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### 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

- Connection Equipment
  - Inboard Hub
  - Docking Cradle
  - Termination Head with Guide frame
  - KX gasket
  - Inboard / Outboard Caps
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

Steady state temp. distribution

Wall temp. after 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
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 provided 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”)

FMC Technologies
We put you first.
And keep you ahead.
UCON-H ongoing projects

- Gazprom – Kirinskoye
- TOTAL – Laggan Tormore
- SHELL – Ormen Lange
- TOTAL – CLOV
- British Gaz – Knarr
Thank you for your attention

Any questions?