

## CEA Extension Shaft Mechanical Coupling/Uncoupling Tool

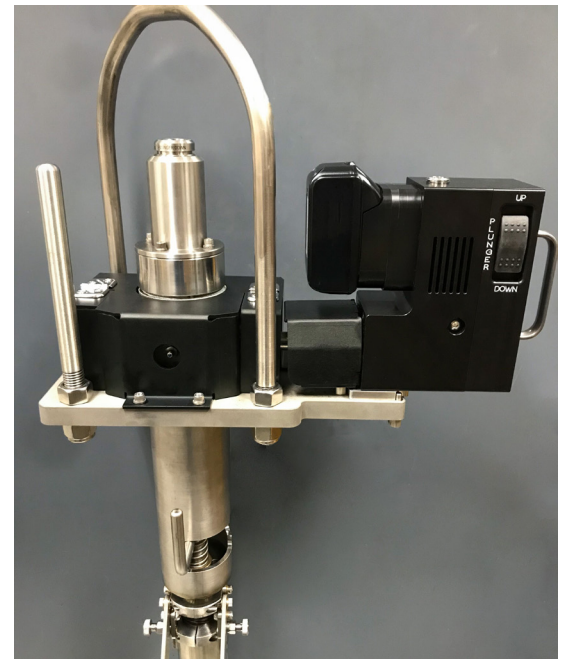
**Simplified Control Element Assembly (CEA) coupling and uncoupling for easier operation and improved reliability**

### Challenge

The OEM uncoupling tool utilizes a hydraulic control unit (console) requiring demineralized water and nitrogen, controlled by an external pendant. During uncoupling activities in a recent outage, critical path time was lost due to a leaking relief valve, resulting in delays for fuel offload while repairs on the deficient console were performed during the no-mode window. This resulted in extra dose, additional consumables and a significant amount of site support. This incident, along with previous failures of the OEM tool system in prior outages, have created an opportunity for the development of a simpler tool.

### Solution

Framatome's Extension Shaft Coupling/Uncoupling tool eliminates the console and thus the need for nitrogen. It also eliminates the need for air hoses, electrical cabling and hydraulic hoses by utilizing a self-contained, proven, onboard battery-operated power supply. An easily removable and rechargeable battery powers a reliable electric motor-driven mechanism that pulls the plunger shaft to allow uncoupling. The motor's push-button operation reduces operator fatigue and decreases the number of people required to operate the tool. This new design can be operated by a single person rather than the three needed for the OEM tool.



### Customer benefits

#### Simplicity improves reliability

- No separate control console
- No air hoses, hydraulic hoses or electrical cabling required
- Self-contained, battery-operated power unit can be replaced without tools

#### Simplified Operation Reduces Dose

- Single reactor technician operation
- Reduced setup time
- No interconnecting umbilicals
- Simple and intuitive battery replacement
- Manual plunger engagement provides tactile and visual feedback to operator
- Visual indication of plunger state (coupled/uncoupled) at top of the tool

### Recent Customer Successes

#### Site one:

Coupling with CUT Tool  
81 Extension Shafts/CEAs  
Start: 9/20/24 0201  
Finish: 9/20/24 0711  
Duration: 5 hours 10 minutes

#### Site two:

Coupling with SCOUT  
61 Extension Shafts/CEAs  
Start: 10/23/24 1815  
Finish: 10/24/24 0133  
Duration: 7 hours 18 minutes



The innovation  
is in the simplicity.



**Your performance  
is our everyday commitment**

**Contact:** [outage@framatome.com](mailto:outage@framatome.com)  
[www.framatome.com](http://www.framatome.com)

The data and information contained herein are provided solely for illustration and informational purposes and create no legal obligations by Framatome. None of the information or data is intended by Framatome to be a representation or a warranty of any kind, expressed or implied, and Framatome assumes no liability for the use of or reliance on any information or data disclosed in this document. Property of Framatome or its affiliates. © 2024 Framatome Inc. All rights reserved.  
A1841-P-US-G-ENG-770-11-24-cea-extension-tool