Contribution ID: **253** Type: **Poster**

The Articulated Inspection Arm Development

Friday, 21 October 2016 08:30 (4 hours)

Fusion Tokamaks are complex machines which require special conditions for their operation, in particular, high vacuum inside the vessel and high temperature of the vessel walls. During plasma phases, the first wall components are highly stressed and the control of their surface is necessary in case of doubt about their condition. To be able to make safely such an inspection in a short period of time is a great advantage. The Articulated Inspection Arm (AIA) developed by the CEA provides the capabilities for fast inspections of the first wall overall surface keeping the vacuum and temperature conditions of the vessel. The robot prototype validated in Tore Supra in 2008 as followed an important upgrade programme in 2013 and 2014 in the view of using it routinely as a baseline diagnostic for the WEST program. The upgrade mainly concerned the cabling, the controller electronics and the supervision system. The aim was to provide a user friendly control of the robot associated with high safety in term of automatic collision avoidance between robot and tokamak.
In the frame of the Associated Laboratory set between CEA/IRFM and CAS/ASIPP, it has been decided to validate the upgrades and qualify the routine usage of the robot in the ASIPP EAST Tokamak. A dedicated vacuum cask for the robot and special adaptations for the EAST machine were developed. Extensive tests were made inside an EAST vessel mock-up. A first Tokamak integration check was made in November 2014 in atmospheric condition. In 2015 the robot was connected to the EAST tokamak and used during the experimental campaign in 2016. In parallel a new robot, the EAST Articulated Maintenance Arm (EAMA), was developed to be able to equip both the WEST and EAST tokamaks by the end of 2016. Details of the robot, the upgrades, the tests and the operation results are presented in the paper. Progress about the development of the new AEMA with its new functionalities will be sketched.

Paper Number

FIP/P7-39

Country or International Organization

France

Primary author: Mr VILLEDIEU, Eric (CEA-IRFM)

Co-authors: Mr VINCENT, Benoit (CEA-IRFM); Mr LIU, Chen (ASIPP); Mr DECHELLE, Christian (CEA-IRFM); Mr FENG, Hansheng (ASIPP); Mr GARGIULO, Laurent (CEA-IRFM); Mr PASTOR, Patrick (CEA-IRFM); Mr NOUAILLETAS, Remy (CEA-IRFM); Mr LE, Roland (CEA-IRFM); Mr SHI, Shanshuang (ASIPP); Mr BRUNO, Vincent (CEA-IRFM); Mr CHENG, Yong (ASIPP); Mr SONG, Yuntao (ASIPP)

Presenter: Mr VILLEDIEU, Eric (CEA-IRFM)

Session Classification: Poster 7

Track Classification: FIP - Fusion Engineering, Integration and Power Plant Design