

DIAGNOSTICS CARRIED BY A LIGHT MULTIPURPOSE DEPLOYER FOR VACUUM VESSEL INTERVENTIONS

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ITER will rely greatly on remote-handling operations to accomplish their scientific missions. Robotic systems will also be required to operate inside vacuum vessels in order to limit or replace human access to minimize radiation exposures, to intervene quickly between experimental sessions for in-vessel inspections and measurements, and to preserve the machine conditioning and thus improve machine availability.

In this prospect, a multipurpose carrier prototype called Articulated Inspection Arm (AIA) was developed by CEA laboratories within the European work program. With an embedded camera, it successfully demonstrated close inspection feasibility inside Tore Supra tokamak without breaking its plasma vessel Ultra High Vacuum and heating conditioning.

The AIA robot was designed to carry interchangeable diagnostics and tools to be plugged on it. This covers various applications for the safety, the operation and the scientific mission (in-vessel inspection, plasma diagnostics calibrations or inner components analysis and treatments).

Water leak localization is a high priority target for ITER, which makes use of a variety of techniques and tools. Among them, remote in-vessel water leak localization is considered to offer a quick response for these complex and non predetermined tasks. In this purpose, water leak localization diagnostics to be plugged on an AIA like robot are being studied at CEA.

This paper presents recent results on leak localization experiments obtained with two types of diagnostics. Feasibility studies of their operation with an AIA-like carrier and their integration in ITER vacuum-vessel will be also presented.