

How to teach an old Tokamak new tricks

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New requests and requirements for ASDEX Upgrade (AUG) diagnostics are bringing new life to the ASDEX Upgrade Tokamak. The AUG team is fighting daily with the problems of any long-lived scientific facility. The ASDEX Upgrade infrastructure, referring to both software and hardware, has been mostly created in-house. It is no longer feasible to just extend and maintain the old legacy systems. However, AUG still maintains a regular schedule of operation, and is expected to run for at least 10 more years, with typically three months of downtime between campaigns. To tackle this challenge, the AUG team is looking at the ITER model as a robust reference for long-term maintenance. To continue serving AUG operations, small upgrades are being deployed in parallel to legacy services to prove the technology and ensure a smooth transition. Following an ITER-like model EPICS is being introduced with a twist: rather than deploying full EPICS at once, small container services are deployed for diagnostics. EPICS device support is developed using ITER Nominal Device Support (NDS v3), connecting it directly to the ASDEX Upgrade Discharge Control System (DCS). At the same time, new EPICS-supported d-tacq devices are being deployed to bridge the gap before jumping to MTCA hardware. Overall, this stepwise approach is already routinely delivering scientific data during AUG operation and provides a comprehensive roadmap to completely renewed AUG diagnostics. In this talk, we share this approach and our current experiences as an established yet evolving facility deploying EPICS and MTCA for the first time.

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