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Development of Diagnostics and Plasma Facing Components for Quasi-Steady-State Operation of the Wendelstein 7-X Stellarator THOMAS SUNN PEDERSEN, Max-Planck-Institute for Plasma Physics, ON BEHALF OF W7-X TEAM — We will report on the present status of the design and manufacturing of the plasma facing components and diagnostics that are being developed for Wendelstein 7-X (W7-X). W7-X is scheduled to start its first physics operation phase (OP1) in 2015, with an uncooled graphite divertor, limiting discharges to 10 seconds at full power. The second operation phase (OP2), scheduled to begin in 2019, will have components actively cooled with water, including a divertor capable of withstanding 10 MW/m^2 in steady state, the so-called High Heat Flux (HHF) divertor. The elements for the HHF divertor are in series production, after a successful R&D program which included rigorous testing at and above the heat flux levels expected in W7-X. Highlights from this R&D program will be presented. Many diagnostics being prepared for OP1 are being designed to withstand the up to 30-minute pulses foreseen for OP2. These diagnostics must therefore already now be designed to be able to withstand the steady state heat loads both due to ECRH stray radiation and due to plasma radiation. Examples of the development, design and testing of optical and magnetic diagnostics for steady state operation will be given.

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