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Progress toward commissioning and plasma operation in NSTX-U[1] MASAYUKI ONO, Princeton Plasma Physics Laboratory, Princeton University, Princeton, NJ 08543, NSTX-U TEAM — NSTX is undergoing a major device upgrade as well as an addition of a second more tangential Neutral Beam Injection (NBI) heating and current drive system. NSTX upgrade will double the toroidal field from 0.5 T to 1 T, the plasma current from 1 MA to 2 MA, the NBI heating and current drive power from 7 MW to 14 MW, and increase the peak field plasma pulse length from 1 sec to 7 sec. More tangential NBI system is designed to achieve 100% non-inductive operation needed for the high beta non-inductive operations. Innovative plasma start-up and ramp-up techniques without the central solenoid operation which is needed for a compact FNSF design will be explored. A major physics/technology goal for NSTX-U is to develop an attractive divertor solution for the very high steady-state divertor heat flux expected for future reactors. With doubling of the heat flux and plasma current, the peak divertor heat flux in NSTX-U could quadruple to about 40 MW/m2 compared to up to 10 MW / m2 of NSTX. For divertor heat mitigation, snow-flake divertor configuration and liquid lithium divertor are being considered. The first plasma operation of NSTX-U is planned in August 2015.

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