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**DOD ASSURED FUELS INITIATIVE: B-52 AIRCRAFT EMISSIONS BURNING A
FISCHER-TROPSCH/JP-8 FUEL BLEND**

Edwin Corporan¹, Matthew J. DeWitt², Christopher D. Klingshirn²

¹AFRL/PRTG, Loop Road N Bldg 490, Wright Patterson Air Force Base Ohio 45433 USA

²University of Dayton Research Institute, 300 College Park, Dayton Ohio 45469 USA

In support of the DoD Assured Fuels Initiative, the emissions of two TF33 P-103 engines burning JP-8 and a 50/50 blend of JP-8 and Fisher Tropsch (F-T) synthetic fuel were characterized to determine the impacts of the synthetic fuel on the B-52 aircraft emissions. The engines were tested on-wing a parked B-52 aircraft at Edwards AFB, and one of the engines was also tested in Test Cell #8 at Tinker AFB. Measurements of the mostly non-volatile particulate matter (PM) emissions were performed using conventional instrumentation to determine particle number, size, mass and smoke number. Soot samples were collected on quartz filters for subsequent chemical analysis and determination of PM mass via carbon burn-off. Gaseous emissions were also quantified. Both TF33 engines were operated at four power settings, idle-to-maximum thrust, and for the test cell runs, a 50 hour engine endurance test at normal power was also conducted. The PM mass emission indices averaged 1.3 - 4.6 g/kg-fuel for operation on JP-8 and 0.65 - 3.1 g/kg-fuel for the F-T blend, therefore, reflecting average reductions of 30-50% in PM mass burning the F-T blend relative to JP-8. Significant reductions with the F-T fuel were also observed on particle numbers and engine smoke numbers. Negligible effects on gaseous products except for reductions in sulfur oxide emissions were observed. Chemical analysis of the soot samples as a function of engine power and fuel, and comparison of on-wing and off-wing engine tests will be presented.