USAF SPGG Advanced Development Program

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I. Structure
   A. Phase I
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IV. Questions

IN: Yang, J.C., et al., Solid Propellant Gas Generators: Proceedings of the 1995 Workshop, NISTIR 5766, June 28-29, 1995 183-189 pp, 1995

Structure of the Program

Phase I

--optimization for transport aircraft

--testing/modifying in AENTF at Wright-Patt

Phase II

--system tests

--testing at Davis-Monthan AFB

Phase III

--flight testing at Edwards AFB

--final report preparation

Phase I

Optimization

--test bed will be CFM-56 engine found on KC135-R

Testing at AENTF

--many conditions within an engine nacelle will be simulated

--analysis of physical relationships

» nacelle volume vs. propellant required

» airflow rate vs. propellant required

» air temperature vs. propellant required

--data obtained on concentrations

Phase II

System tests

--safety of flight

--analysis of effects of employment

--vibration

--maintainability

--reliability

--personnel safety

--location and distribution of generators

Davis-Monthan tests

--hang engine on aircraft wing

--simulate flight conditions

--test overpressurization, corrosion

Phase III

Flight testing

--flight demonstration vs. qualification

--in-flight discharge

--verify system compatibility

--long-term effects on propellant

ISSUES

- need data for transport aircraft
- long distribution distances, > 40 ft
- hot engine casings causing reignition
- chemical vs inert gas generator
- physical relationships with gas generators
- retrofits--bottle shape, size
- overpressurization
- inadvertent discharge, personnel safety, etc.
- concentration measurements

Conclusions

Technology output

--methodology to be used for all future large aircraft applications

--design information on propellant config. and arrangement for cubic ext. spaces

--data on plumbing size for distribution and mitigation of overpressurization

--flow rate requirements

--effects of agent release on surrounding engine structure

--sizing for different fire conditions

--guidance on maintenance, safety, and aircraft integration