The submission of an abstract is an agreement to complete a final paper for publication and attend the meeting to present this information. Complete all information requested in the author and co-author information sections; the first author listed will receive paper acceptance notices and all correspondence. Abstracts must be submitted electronically; submittal instructions are located in the call for papers. The abstract deadline date is June 13, 2011.

**ABSTRACT INFORMATION**

Title: The J-2X Fuel Turbopump - Design, Development, and Test

Submitted for consideration to: [ ] MSS  [ ] LPS  [ ] SPS
For inclusion in Technical Area: [ ] 1  [ ] 2  [ ] 3  [ ] 4  [ ] 5  [ ] 6
Security Classification of Presentation: [ ] Unclassified
Security Classification of Paper: [ ] Unclassified
Contract Number(s) Under Which Work was Performed: NNM06AB13C [ ] IR&D
Is this paper an update? [ ] Yes  [ ] No  Has it been presented elsewhere? [ ] Yes  [ ] No  Is this a student paper? [ ] Yes  [ ] No

**AUTHOR INFORMATION**

<table>
<thead>
<tr>
<th>Author/Presenter Name</th>
<th>Affiliation</th>
<th>Address</th>
<th>City</th>
<th>State</th>
<th>Zip</th>
</tr>
</thead>
<tbody>
<tr>
<td>James G. Tellier</td>
<td>Pratt &amp; Whitney Rocketdyne</td>
<td>6633 Canoga Ave. P.O. Box 7922</td>
<td>Canoga Park</td>
<td>CA</td>
<td>91309</td>
</tr>
<tr>
<td>Telephone: 818-586-0487</td>
<td>Fax:</td>
<td>e-mail: <a href="mailto:james.tellier@pwr.utc.com">james.tellier@pwr.utc.com</a></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2nd Author: Lakiesha V. Hawkins  
Affiliation NASA  
Address George C. Marshall Space Flight Center Mail Code ER31  
City Marshall Space Flight Center  
State AL  
Zip 35812  
Telephone (256)544-8911  
Fax:  
e-mail: lakiesha.v.hawkins@nasa.gov

3rd Author: Brian H. Shinguchi  
Affiliation Pratt & Whitney Rocketdyne  
Address 6633 Canoga Ave. P.O. Box 7922  
City Canoga Park  
State CA  
Zip 91309  
Telephone 818-586-8839  
Fax:  
e-mail: brian.shinguchi@pwr.utc.com

Additional Author(s): Matthew W. Marsh  
Affiliation NASA  
Address George C. Marshall Space Flight Center Mail Code ER31  
City Marshall Space Flight Center  
State AL  
Zip 35812  
Telephone (256)544-1773  
Fax:  
e-mail: matthew.w.marsh@nasa.gov
MANAGEMENT APPROVAL

The individual below certifies that the required resources are available to present this paper at the above subject JANNAF meeting.

Responsible Manager authorizing presentation:

Title/Agency: 

Telephone Number: 

e-mail: 

Date:
Pratt and Whitney Rocketdyne (PWR), a NASA subcontractor, is executing the design, development, test, and evaluation (DDT&E) of a liquid oxygen, liquid hydrogen two hundred ninety four thousand pound thrust rocket engine initially intended for the Upper Stage (US) and Earth Departure Stage (EDS) of the Constellation Program Ares-I Crew Launch Vehicle (CLV). A key element of the design approach was to base the new J-2X engine on the heritage J-2S engine with the intent of uprating the engine and incorporating SSME and RS-68 lessons learned. The J-2S engine was a design upgrade of the flight proven J-2 configuration used to put American astronauts on the moon. The J-2S Fuel Turbopump (FTP) was the first Rocketdyne-designed liquid hydrogen centrifugal pump and provided many of the early lessons learned for the Space Shuttle Main Engine High Pressure Fuel Turbopumps. This paper will discuss the design trades and analyses performed for the current J-2X FTP to increase turbine life; increase structural margins, facilitate component fabrication; expedite turbopump assembly; and increase rotodynamic stability margins. Risk mitigation tests including inducer water tests, whirligig turbine blade tests, turbine air rig tests, and workhorse gas generator tests characterized operating environments, drove design modifications, or identified performance impact. Engineering design, fabrication, analysis, and assembly activities support FTP readiness for the first J-2X engine test scheduled for July 2011.