

NASA/CP—2005-213655/VOL1



2004 NASA Seal/Secondary Air System Workshop

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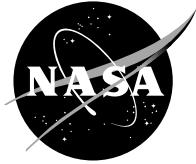
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2004 NASA Seal/Secondary Air System Workshop

Proceedings of a conference held at Ohio Aerospace Institute
sponsored by NASA Glenn Research Center
Cleveland, Ohio
November 9–10, 2004

National Aeronautics and
Space Administration

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This work was sponsored by the Low Emissions Alternative Power Project of the Vehicle Systems Program at the NASA Glenn Research Center.

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Executive Summary

Volume 1

The 2004 NASA Seal/Secondary Air System workshop covered the following topics: (i) Overview of NASA's new Exploration Initiative program aimed at exploring the Moon, Mars, and beyond; (ii) Overview of the NASA-sponsored Ultra-Efficient Engine Technology (UEET) program; (iii) Overview of NASA Glenn's seal program aimed at developing advanced seals for NASA's turbomachinery, space, and reentry vehicle needs; (iv) Reviews of NASA prime contractor and university advanced sealing concepts including tip clearance control, test results, experimental facilities, and numerical predictions; and (v) Reviews of material development programs relevant to advanced seals development.

The NASA UEET overview illustrated for the reader the importance of advanced technologies, including seals, in meeting future turbine engine system efficiency and emission goals. For example, the NASA UEET program goals include an 8- to 15-percent reduction in fuel burn, a 15-percent reduction in CO₂, a 70-percent reduction in NO_x, CO, and unburned hydrocarbons, and a 30-dB noise reduction relative to program baselines.

The workshop also covered several programs NASA is funding to develop technologies for the Exploration Initiative and advanced reusable space vehicle technologies. NASA plans on developing an advanced docking and berthing system that would permit any vehicle to dock to any on-orbit station or vehicle, as part of NASA's new Exploration Initiative. Plans to develop the necessary mechanism and "androgynous" seal technologies were reviewed. Seal challenges posed by reusable re-entry space vehicles include high-temperature operation, resiliency at temperature to accommodate gap changes during operation, and durability to meet mission requirements.

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2004 NASA Seal/Secondary Air System Workshop

Attendees

Last	First	Company	City	State	Zip	Phone	Email
Albers	Robert J.	General Electric	Cincinnati	OH	45215	513.243.7039	bob.albers@ae.ge.com
Assion	Joe	Analex Corp.	Cleveland	OH	44135	216.433.6712	jassion@grc.nasa.gov
Bauman	Steve	NASA Glenn Research Center	Cleveland	OH	44135	216.433.3826	steve.bauman@nasa.gov
Bill	Robert	NASA Glenn Research Center	Cleveland	OH	44135	216.433.3694	robert.c.bill@grc.nasa.gov
Bond	Bruce	Jackson Bond Enterprises, LLC	Rochester	NH	03867	603.335.7913	brucebond@earthlink.net
Bown	Charles	ATK Thiokol	Brigham City	UT	84302	435.279.6259	Charley.Bown@ATK.com
Boyle	Marcia	GE Aircraft Engines	Cincinnati	OH	45215	513.243.5315	Marcia.Boyle@ae.ge.com
Braun	Minel (Jack)	University of Akron	Akron	OH	44325	330.972.7734	mjbraun@uakron.edu
Breen	Dan	NASA Glenn Research Center	Cleveland	OH	44135	216.433.2660	daniel.p.breen@grc.nasa.gov
Cash	Carol	GE Aircraft Engines	North Olmsted	OH	44070	440.777.9545	carol.cash@ae.ge.com
Chen	Victor	The Boeing Company	Huntington Beach	CA	92647	714.896.4989	victor.chen@boeing.com
Christiansen	Richard	NASA Glenn Research Center	Cleveland	OH	44135	216.433.5308	Richard.Christiansen@nasa.gov
Chupp	Ray	GE Global Research	Niskayuna	NY	12302	518.387.7550	raymond.chupp@crd.ge.com
Cikanek	Harry	NASA Glenn Research Center	Cleveland	OH	44135	216.433.6196	harry.cikanek@nasa.gov
Clark	Stephen	Boeing	Seattle	WA	98124	425.237.1224	stephen.f.clark@boeing.com
Clarke	Dana	Applied Innovation Alliance, LLC	West Bloomfield	MI	48323	248.682.3368	dclarke@aia-consulting.com
Compton	Tom	GE Transportation	Evendale	OH	45215	513.243.2422	tom.compton@ae.ge.com
Daniels	Chris	NASA Glenn Research Center	Cleveland	OH	44135	216.433.6714	christopher.c.daniels@grc.nasa.gov
Datta	Amit	Advanced Components & Materials Inc.	E. Greenwich	RI	02818	401.885.5064	ADatta@worldnet.att.net
DeCastro	Jonathan	NASA Glenn Research Center	Cleveland	OH	44135	216.433.3946	jonathan.decastro@grc.nasa.gov
Delgado	Irebert	NASA Glenn Research Center	Cleveland	OH	44135	216.433.3935	irebert.r.delgado@nasa.gov
DeMange	Jeffrey J.	NASA Glenn Research Center	Cleveland	OH	44135	216.433.3568	Jeffrey.Demange@nasa.gov
DiCarlo	James	NASA Glenn Research Center	Cleveland	OH	44135	216.433.5514	james.a.dicarlo@nasa.gov
Dietzel	Bill	Flowserve FSD	Kalamazoo	MI	49001	269.226.3493	wdietzel@flowserve.com
Dimofte	Florin	University of Toledo	Cleveland	OH	44135	216.433.7468	florin.dimofte@nasa.gov
Dobek	Louis J.	Pratt and Whitney	East Hartford	CT	06108	860.565.3034	dobeklj@pweh.com
Dunlap	Pat	NASA Glenn Research Center	Cleveland	OH	44135	216.433.3017	patrick.h.dunlap@nasa.gov
Eberly	Eric	NASA Marshall Space Flight Center	MSFC	AL	35812	256.544.2092	eric.a.eberly@nasa.gov
Eppehimer	John	Stein Seal Company	Kulpsville	PA	19443	215.256.0201	JohnEppehimer@steinseal.com
Erker	Art	NASA Glenn Research Center	Cleveland	OH	44135	216.433.2911	arthur.erker@analex.com
Finkbeiner	Joshua	NASA Glenn Research Center	Cleveland	OH	44135	216.433.6080	joshua.finkbeiner@nasa.gov
Flaherty	Andrew	Flowserve Corp.	Temecula	CA	92590	951.719.4412	Aflaherty@Flowserve.com
Garrett	William	Powdermet Inc.	Euclid	OH	44117	216.404.0053x118	wrgarrett@powdermetinc.com
Garrison	Glenn	Stein Seal Company	Kulpsville	PA	19443	215.256.0607	glenngarrison@steinseal.com
Geisheimer	Jon	Radatec, Inc.	Atlanta	GA	30308	404.526.6037	jong@radatec.com
Ginty	Carol	NASA Glenn Research Center	Cleveland	OH	44135	216.433.3335	Carol.Ginty@nasa.gov
Giriunas	Julius	NASA Glenn Research Center	Cleveland	OH	44135	216.433.3794	julius.giriunas@nasa.gov
Giron	Mark	PerkinElmer Fluid Sciences	Beltsville	MD	20705	301.902.3648	mark.giron@perkinelmer.com
Goshorn	David	GE Aircraft Engines	Cincinnati	OH	45215	513.243.8164	david.goshorn@ae.ge.com
Gravereaux	Stephen J.	Advanced Products Company, Inc	North Haven	CT	06473	860.658.6200	sgravereaux@advpro.com
Grondahl	Clayton	CMG Tech, LLC	Rexford	NY	12148	518.371.5050	cmgtech@earthlink.net
Harmon	Crystal	Pratt & Whitney	North Olmsted	OH	44070	440.734.3990	crystal.harmon@pw.utc.com
Hendricks	Robert C.	NASA Glenn Research Center	Cleveland	OH	44135	216.977.7507	robert.c.hendricks@nasa.gov
Herron	William L.	General Electric	Cincinnati	OH	45215	513.243.7445	william.herron@ae.ge.com
Higgins	Mark	PerkinElmer Fluid Sciences	Beltsville	MD	20705	301.902.3645	mark.higgins@perkinelmer.com
Jackson	Hank	Jackson Bond Enterprises, LLC	Rochester	NH	03867	603.335.7913	
Justak	John F.	Advanced Technologies Group	Stuart	FL	34994	772.283.0253	jjustak@advancedtg.com
Keith	Theo G.	NASA Glenn Research Center	Cleveland	OH	44135	216.433.3944	theo.g.keith@nasa.gov

2004 NASA Seal/Secondary Air System Workshop

Attendees

Last	First	Company	City	State	Zip	Phone	Email
Kiser	J. Douglas	NASA Glenn Research Center	Cleveland	OH	44135	216.433.3247	James.D.Kiser@nasa.gov
Klamar	Joseph	JGK TechnoSystems	Hudson	OH	44236	330.656.3274	jgklamar@yahoo.com
Kraft	Thomas	NASA Glenn Research Center	Cleveland	OH	44135	216.433.2936	thomas.g.kraft@nasa.gov
Kroha	Michael	Flowserve	Kalamazoo	MI	49001	269.226.3428	mkroha@flowserve.com
Krumpelt	Michael	Argonne National Laboratory	Argonne	IL	60439	630.252.8520	krumpelt@cmt.anl.gov
Lattime	Scott	OAI - NASA Glenn Research Center	Cleveland	OH	44135	216.433.5953	scott.lattime@nasa.gov
Loewenthal	Robert	Advanced Components & Materials Inc.	Jamestown	RI	02835	401.423.1957	bobloew@cox.net
Makhobey	Mark	Car-Graph, Inc.	Tempe	AZ	85281	480.894.1356	mmakhobey@car-graph.com
McCall	Ryan	Garlock Helicoflex	Columbia	SC	29209	803.783.1880	ryan.mccall@garlock.com
Melis	Matthew	NASA Glenn Research Center	Cleveland	OH	44135	216.433.3322	Matthew.Melis@grc.nasa.gov
More	D. Greg	Advanced Products Company	North Haven	CT	06473	203.985.3141	gmore@advpro.com
Munson	John	Rolls Royce Corp.	Indianapolis	IN	46260	317.230.6409	John.H.Munson@Rolls-Royce.com
Nagpal	Vinod	N&R Engineering and Management Services	Parma Hts.	OH	44130	440.845.7020	vnagpal@nrengineering.com
Opila	Elizabeth	NASA Glenn Research Center	Cleveland	OH	44135	216.433.8904	Elizabeth.Opila@nasa.gov
Oswald	Jay	Case Western Reserve U.	Cleveland	OH	44106	216.754.1808	jxo26@po.cwru.edu
Paolillo	Roger	Pratt & Whitney	East Hartford	CT	06108	860.557.1460	paolilre@pwheh.com
Paquette	Ted	Refractory Composites, Inc.	Glen Burnie	MD	21060	410.768.2490	tedpaquette@rciusa.com
Parrish	Tom	Eaton Aeroquip	Jackson	MI	49202	517.789.4171	TomAParrish@eaton.com
Pendleton	Edmund	Air Force Research Lab/VASD	Wright Patterson AFB	OH	45433	937.255.7387	Edmund.Pendleton@wpafb.af.mil
Pickett	Paul	Solar Turbines, Inc.	San Diego	CA	92186	619.544.5420	pickett_paul_e@soltarturbines.com
Pierson	Hazel M.	University of Akron	Akron	OH	44325	330.941.3017	hmpierson@ysu.edu
Proctor	Margaret	NASA Glenn Research Center	Cleveland	OH	44135	216.977.7526	margaret.p.proctor@nasa.gov
Rawlings	Christopher	Florida Turbine Technologies, Inc.	Jupiter	FL	33477	561.746.3317	crawlings@fttinc.com
Robbie	Malcolm	NASA Glenn Research Center	Cleveland	OH	44135	216.433.5490	malcolm.g.robbie@grc.nasa.gov
Robertson	Brandan	NASA Johnson Space Center	Houston	TX	77058	281.483.3732	brandan.r.robertson@nasa.gov
Roche	Brian	Stein Seal Company	Kulpsville	PA	19443	215.256.0201	brianroche@steinseal.com
Ruiz	Rafael	General Electric	Cincinnati	OH	45215	513.243.5364	rafael.ruiz@ae.ge.com
Sankovic	Denis	Radian Milparts	Eastlake	OH	44095	440.946.5921	denis@milmilparts.net
Shaughnessy	Dennis	Pratt & Whitney	East Hartford	CT	06108	860.557.1675	dennis.shaughnessy@pw.utc.com
Sherman	Andrew	Powdermet Inc.	Euclid	OH	44117	216.404.0053	powdermet@earthlink.net
Shi	Jun	United Technologies Research Center	East Hartford	CT	06108	860.610.1539	shij@utrc.utc.com
Smallwood	Drew	The Boeing Company	Huntington Beach	CA	92648	714.896.2098	Drew.Smallwood@boeing.com
Solomon	Dan	PerkinElmer Fluid Sciences	Bethesda	MD	20705	301.902.3442	dan.solomon@perkinelmer.com
Spoth	Kevin	Honeywell - Engines & Systems	Phoenix	AZ	85034	602.231.2524	kevin.spoth@honeywell.com
Stango	Robert	Marquette University	Milwaukee	WI	53233	414.288.6972	Robert.Stango@mu.edu
Steinetz	Bruce	NASA Glenn Research Center	Cleveland	OH	44135	216.433.3302	bruce.m.steinetz@nasa.gov
Taylor	Shawn	Case Western Reserve U.	Cleveland Hts.	OH	44106	216.320.1332	smt16@cwru.edu
Taylor	Thomas	Praxair Surface Technologies	Indianapolis	IN	46224	317.240.2614	Thomas_Taylor@praxair.com
Thomas	G. Richard	Bently Pressurized Bearing Company	Minden	NV	89423	775.783.4642	richard.thomas@bpb-co.com
Thomas	Mark D.	ATK Thiokol Inc	Brigham City	UT	84302	435.863.3582	mark.thomas@atk.com
Tritz	Terry	The Boeing Company	Seattle	WA	98124	425.234.5194	terrance.g.tritz@boeing.com
Turnquist	Norm	GE Global Research Center	Niskayuna	NY	12309	518.387.5978	turnquist@crd.ge.com
Valliere	Alan	Car-Graph, Inc.	Tempe	AZ	85281	480.894.1356	avalliere@car-graph.com
Virtue	John	Pratt & Whitney	East Hartford	CT	06450	860.565.4770	virtuej@pwheh.com
Watts	O. A. (Bud)	Allison Advanced Development Co.	Indianapolis	IN	46202	317.230.6726	bud.watts@aadco.com
Yun	HeeMan	NASA Glenn Research Center	Cleveland	OH	44135	216.433.6089	heeeman.yun@grc.nasa.gov
Zheng	Xiaoqing	PerkinElmer	Warwick	RI	02888	401.473.2274	Xiaoqing.Zheng@PerkinElmer.com

REPORT DOCUMENTATION PAGE			<i>Form Approved OMB No. 0704-0188</i>
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.			
1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED Conference Publication	
4. TITLE AND SUBTITLE 2004 NASA Seal/Secondary Air System Workshop		5. FUNDING NUMBERS WBS-22-714-70-42	
6. AUTHOR(S) Bruce M. Steinetz and Robert C. Hendricks, editors			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) National Aeronautics and Space Administration John H. Glenn Research Center at Lewis Field Cleveland, Ohio 44135-3191		8. PERFORMING ORGANIZATION REPORT NUMBER E-15144-1	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) National Aeronautics and Space Administration Washington, DC 20546-0001		10. SPONSORING/MONITORING AGENCY REPORT NUMBER NASA CP—2005-213655-VOL1	
11. SUPPLEMENTARY NOTES Proceedings of a conference held at Ohio Aerospace Institute sponsored by NASA Glenn Research Center, Cleveland, Ohio, November 9–10, 2004. Responsible person, Bruce M. Steinetz, organization code RSM, 216-433-3302.			
12a. DISTRIBUTION/AVAILABILITY STATEMENT Unclassified - Unlimited Subject Categories: 37, 16, and 99		12b. DISTRIBUTION CODE Distribution: Nonstandard Available electronically at http://gltrs.grc.nasa.gov This publication is available from the NASA Center for AeroSpace Information, 301-621-0390.	
13. ABSTRACT (Maximum 200 words) The 2004 NASA Seal/Secondary Air System workshop covered the following topics: (i) Overview of NASA's new Exploration Initiative program aimed at exploring the Moon, Mars, and beyond; (ii) Overview of the NASA-sponsored Ultra-Efficient Engine Technology (UEET) program; (iii) Overview of NASA Glenn's seal program aimed at developing advanced seals for NASA's turbomachinery, space, and reentry vehicle needs; (iv) Reviews of NASA prime contractor and university advanced sealing concepts including tip clearance control, test results, experimental facilities, and numerical predictions; and (v) Reviews of material development programs relevant to advanced seals development. The NASA UEET overview illustrated for the reader the importance of advanced technologies, including seals, in meeting future turbine engine system efficiency and emission goals. For example, the NASA UEET program goals include an 8- to 15-percent reduction in fuel burn, a 15-percent reduction in CO ₂ , a 70-percent reduction in NO _x , CO, and unburned hydrocarbons, and a 30-dB noise reduction relative to program baselines. The workshop also covered several programs NASA is funding to develop technologies for the Exploration Initiative and advanced reusable space vehicle technologies. NASA plans on developing an advanced docking and berthing system that would permit any vehicle to dock to any on-orbit station or vehicle, as part of NASA's new Exploration Initiative. Plans to develop the necessary mechanism and "androgynous" seal technologies were reviewed. Seal challenges posed by reusable re-entry space vehicles include high-temperature operation, resiliency at temperature to accommodate gap changes during operation, and durability to meet mission requirements.			
14. SUBJECT TERMS Seals; Turbine; Clearance control, Materials; Analyses; Experimental; Design, Docking mechanism; Leakage			15. NUMBER OF PAGES 400
			16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT

