FALL 2014

JANNAF NEWS

JOINT ARMY-NAVY-NASA-AIR FORCE INTERAGENCY PROPULSION COMMITTEE

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JANNAF to Converge in the Picturesque City of Albuquerque

Major General Thomas J. Masiello

Four subcommittees, 50 technical sessions, 6 specialist sessions, 2 workshops, 5 tutorials, 4 town hall meetings, 14 panel meetings—a total of nearly 300 presentations, and Albuquerque in December—all of this activity means JANNAF is heading for the Land of Enchantment! Join us at the Hyatt Regency Albuquerque December 8–11, 2014, for the 46th Combustion (CS), 34th Airbreathing Propulsion (APS), 34th Exhaust Plume and Signatures (EPSS), and 28th Propulsion Systems Hazards (PSHS) Joint Subcommittee Meeting.

Major General Thomas J. Masiello, Commander of the Air Force Research Laboratory at Wright-Patterson AFB, Ohio, will present the keynote at this year's conference. The title of his address is "Game-Changing Technology for the Department of Defense." His presentation will provide a strategic overview of where we are as a nation in defense-related propulsion. We are on the verge of a breakthrough in the application of scramjet propulsion with the High-Speed Strike Weapon demonstrations. The fallout from the Ukrainian situation may presage a seismic shift in U.S. liquid rocket propulsion, forcing us to accelerate the Hydro Carbon Boost program and facilitating development of domestic capability through a replacement for the RD-180. Coupled with NASA's work on the Space Launch System (SLS), these advancements herald a significant leap forward in U.S. rocket propulsion capabilities. Also, the maturation of third-stream technologies for jet turbine propulsion represents another step-function in capability that will allow the simultaneous performance improvement at significant levels of both thrust and specific fuel consumption. However, there are concerns, too, such as declining U.S. industrial base and expertise, limited infrastructure capacity, and budget pressures. It's an exciting time to be in the propulsion business!

An optional tour of the Energetic Materials Research and Testing Center (EMRTC) is being offered to meeting attendees on Friday, December 12, 2014. EMRTC is a research division of New Mexico Tech located in Socorro, New Mexico. EMRTC has more than 30 individual test ranges located on 42 square miles of testing facility adjacent to the New Mexico Tech campus.

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The Chemical Propulsion Information Analysis Center (CPIAC), a DoD Information Analysis Center, is sponsored by the Defense Technical Information Center (DTIC) and the Joint Army-Navy-NASA-Air Force (JANNAF) Interagency Propulsion Committee. The purpose of JANNAF is to solve propulsion problems, affect coordination of technical programs, and promote an exchange of technical information in the areas of missile, space, and gun propulsion technology.

CPIAC is responsible for the acquisition, compilation, analysis, and dissemination of information and data relevant to chemical, electric, and nuclear propulsion technology. A fee commensurate with CPIAC products and services is charged to subscribers, who must meet security and need-to-know requirements.

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CPIAC is a JANNAF- and DTIC-sponsored DoD Information Analysis Center operated by The Johns Hopkins University Whiting School of Engineering under contract W91QUZ-05-D-0003.

CPIAC's Technical/Bibliographic Inquiry Service

CPIAC offers a variety of services to its subscribers, including responses to technical/bibliographic inquiries. Answers are usually provided within three working days, in the form of telephoned, faxed, electronic, or written technical summaries. Customers are provided with copies of JANNAF papers, excerpts from technical reports, bibliographies of pertinent literature, names of recognized experts, propellant/ingredient data sheets, computer programs, and/or theoretical performance calculations. The CPIAC staff responds to nearly 400 inquiries per year, from more than 150 customer organizations. For further information, please contact Nick Keim by email to nkeim@cpiac.jhu.edu. Representative recent inquiries include:

TECHNICAL INQUIRIES

- Information on best practices for flexible combined detonation cord (FCDC) manifolds. (REQ 28283)
- Data to support plume modeling of the Trident I C4 First Stage. Including normal operating conditions (pressure), nozzle geometry, propellant composition, and exhaust plume species. (REQ. 28663)
- Survey of air launch systems using propellants with ferrocene based additives. (REQ. 28587)
-

BIBLIOGRAPHIC INQUIRIES

- Bibliography of literature on Azides and Azide containing compounds for use as rocket propellants. This literature survey included topics such as synthesis, characterization, compatibility as well as bipropellant, monopropellant, and gelled propellant uses and performance properties. (Req. 28304)
- Literature on hydrocarbon fuel (RP) flamelet formulation and combustion kinetics. (Req. 28781)
- Low burn rate aluminized propellants and burn rate suppressing materials. (Req. 28606)

CPIAC Subscriptions

CPIAC forwarded GFY 2014 subscription renewal packets to its customer base for continued products and services. We would like to take this opportunity to inform the community that a minimum subscription of $1,775 entitles subscribers to unlimited free access for all employees of your organization to our Propulsion Information Retrieval System; any two online databases housed in our Chemical Propulsion Information Network (CPIN); and six hours (prepaid) of technical/bibliographic inquiry support. For information concerning a CPIAC subscription and/or products and services, please contact Hwei-Ru Chen at 410-992-7300, ext. 212 or email hchen@cpiac.jhu.edu.

(continued from page 1)

The tour will include a brief overview of current and recent research and testing programs performed by EMRTC, including large-scale explosive tests, small-scale propulsion testing, and work related to homemade explosives. A tour of small-scale facilities will include the Chemistry Labs, where explosive synthesis and small-scale testing is performed, and the Optics Lab, which specializes in visualization of shock waves and compressible flow phenomena. The tour will conclude with a trip to the field-testing range for a large-scale explosion demonstration of a car bomb.

Transportation between the Hyatt Regency Albuquerque and the EMRTC facility will not be provided. There is no cost to participate in the tour, and details are available in the Meeting Program at: https://www.jannaf.org/mtgs/Dec2014/pages/index.html.

Those who register and submit payment on or before November 24 will qualify for the discounted registration fee, and those planning to attend classified sessions need to register no later than December 2.

Deadlines and registration dates are quickly approaching, so authors and attendees should be reviewing the Preliminary Program to ensure they don't miss this exciting meeting.

A Brief Introduction to JANNAF

The JANNAF Interagency Propulsion Committee (IPC) coordinates fundamental research, exploratory development, and advanced development programs; standardizes procedures for nomenclature; promotes and facilitates the exchange of technical information; and accomplishes problem solving in the areas of joint agency interest on propulsion systems for missiles, rockets, boosters, spacecraft, satellites, and guns.

JANNAF subcommittees focus their resources on technical issues of interest to the JANNAF agencies. The Combustion Subcommittee (CS) covers analytical modeling and experimental research on chemical combustion phenomena for solid, liquid, hybrid, and airbreathing missile, space, underwater, and gun propulsion systems. The Airbreathing Propulsion Subcommittee (APS) addresses technical problems and issues associated with turbojet, ramjet, scramjet, and combined- or mixed-cycle engines. The Exhaust Plume and Signatures Subcommittee (EPSS) addresses the phenomena associated with the exhaust from rockets, ramjets, space, and gun propulsion systems. The EPSS Signatures panel promotes technical interchange among members of the Electro-Optical/Infrared (EO/IR) signature community. The Propulsion Systems Hazards Subcommittee (PSHS) examines potential hazards associated with missile, space, and gun propulsion systems.

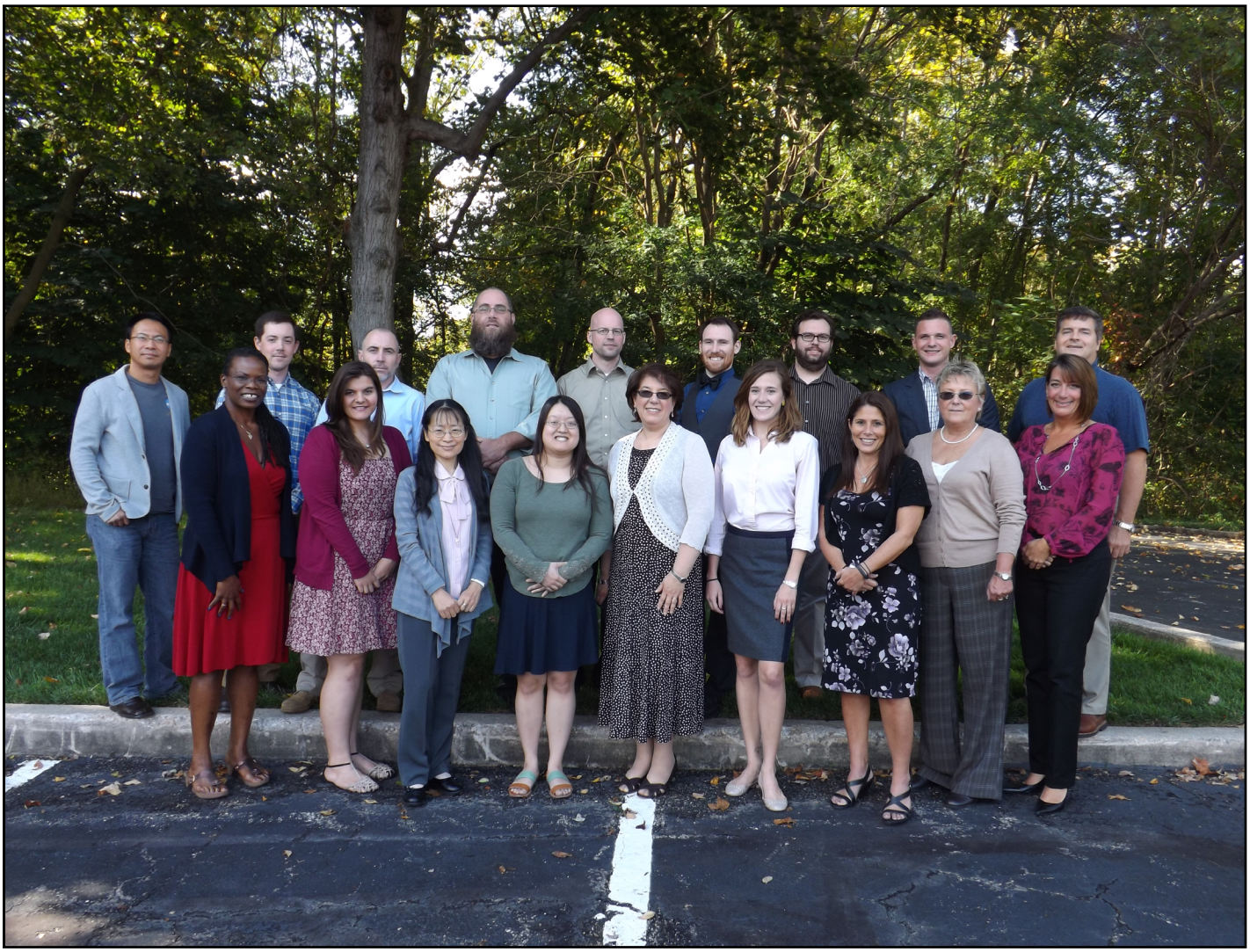
The Preliminary Program for the December 2014 JANNAF program is available from the JANNAF Website, https://www.jannaf.org/mtgs/Dec2014/pages/index.html, and updates to the DOD approval status are available by a link on that page. The program for the individual subcommittee sessions was set at a planning meeting in August, and final papers are being prepared.

New Navy Member on the JANNAF Technical Executive Committee

Frank C. Tse

Mr. Frank C. Tse of the Naval Surface Warfare Center in Indian Head, MD, has joined the JANNAF Technical Executive Committee (TEC) as a voting Navy member. Frank began his association with JANNAF in the early 1980s. He has subsequently served in numerous leadership positions, including Technical Steering Group Member (and twice Chair) of the Structures and Mechanical Behavior Subcommittee (1986–2014); Navy member on the Program Committee of the JANNAF Propulsion Meetings (JPM) (2002–14); JPM Chair (2005 and 2012); and managing the development of "Stress Relaxation Test Standards" for solid propellants (published in CPIA Publication 21) and "Guidelines for Determining Rocket Motor Grain Design Margins of Safety" (published as CPIAC Publication 612). His dedication and conviction in the work of JANNAF will make him a vital participant in this new management role.

Mr. Tse replaces Mr. Robert Kaczmarek, who retired from Navy service in August 2014. Mr. Kaczmarek served as a Navy member on the TEC from 2007 to 2014, and as an integral supporter of the Propellant Explosives and Development Characterization Subcommittee. He was also an Associate Editor of the JANNAF Journal on Propulsion and Energetics. We thank him for his JANNAF service and wish him all the best in his retirement.



CPIAC Staff, October 2014. Pictured from top left: Paco Wong, Chris Hewitt, Bill Bagley, Director Pete Zeender, Andy Taylor, David Owen, Nick Keim, Joe Skrodzki, and Bruce Dennett. Pictured from bottom left: Jennean Everett, Kathleen Biglari, Hwei-Ru Chen, Kristina Baker, Shelley Cohen, Claire Wilhelm, Tricia Reider, Debbie Eggleston, and Mary Gannaway, Not pictured: Ben Hill-Lam and Linda McLean.

Photographed by Richard Mason

Announcing the New JANNAF Website!

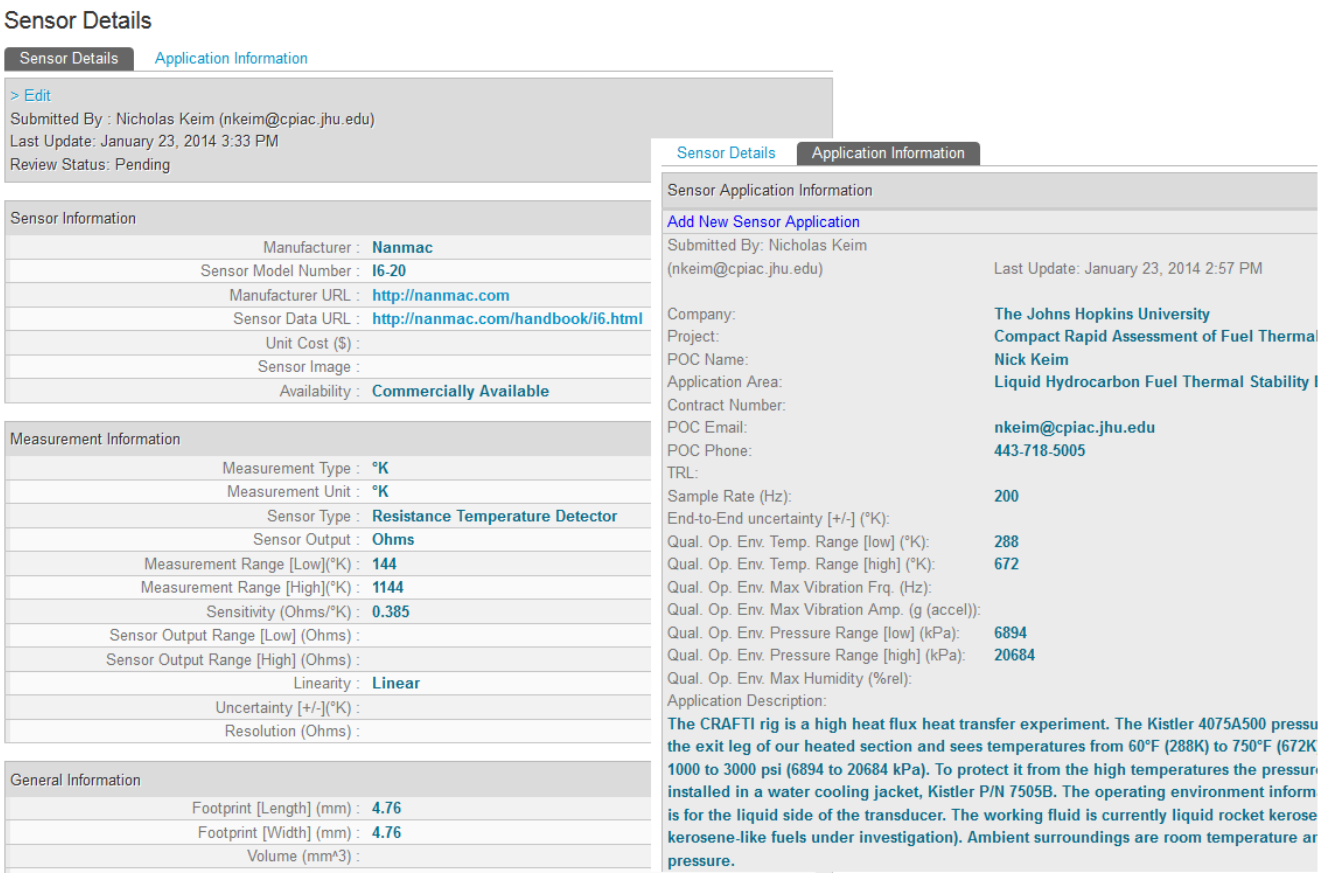
The JANNAF website has a new look! The new theme makes it easy to find the information you need quickly. The website content has been updated to include a history of JANNAF, updated descriptions of the various JANNAF committees, links to the upcoming meetings, information about the JANNAF Journal, and a brief overview for the many other JANNAF products available. Also, access to the JANNAF databases is now available from both the JANNAF and CPIAC websites under a Resources menu. Visit https://www.jannf.org today!

COMING SOON!

A new JANNAF portal with collaborative space for each subcommittee and panel is currently under development! Look for future announcements in early 2015 on how to obtain your new online account to access the JANNAF collaboration portal!

The Joint Sensor Database

Since 2007, the Modeling & Simulation (MSS), Liquid Propulsion (LPS), and Structures & Mechanical Behavior (SMBS) subcommittees have held a series of workshops focused on identifying needs and potential solutions to issues related to data collection and sensor systems for health monitoring and health management. In 2010, stakeholders from the JANNAF community as well as the DoE National Energy Technology Laboratory (NETL) agreed to collaborate on the development of a database to collect information on sensors and their use. This year, the Joint Sensor Database was launched and is available to all users of the CPIAC, JANNAF, and NIRPS secure online portals. One of the key distinguishing features of this database from previous JANNAF database efforts is the collaborative nature of the data collection and verification. All users who have an account are able to create new entries for new sensors, edit information for existing sensors, and add application records to a sensor. Records will be periodically reviewed by the joint MSS Integrated Health Management and LPS Engine Health Management panels as part of their activities to ensure that data is not misrepresented. Information collected includes basics such as what property is measured by a particular sensor, its sensitivity, and operating environment down to fine detail such as communication protocol for smart sensors. In addition to basic datasheet-type information on the sensor itself, users of the database can elect to create an application record for a sensor; these application records are useful for the community to document the specific implementation and performance of a sensor for an application.



The Joint Sensor Database information tool.

JANNAF and the IAC Program Streamline, Collaborate, and Stay Nimble

Change is afoot in the propulsion community!

As of January 1, 2014, the Defense Technical Information Center (DTIC) initiated the final phase of restructuring the Basic Center Operations of the Information Analysis Center (IAC) program with the award of the Defense Systems Information Analysis Center (DSIAC). The Johns Hopkins University (JHU) will continue to provide technical analysis support in propulsion and energetics as a key member on the DSIAC team led by SURVICE Engineering Company and continue to engage in data discovery, analysis, and response to technical inquiries.

After nearly 35 years of participation in the DTIC IAC program, JANNAF support activities will be migrated to a contract sponsored by another Government agency, ushering in a new era of joint agency cooperation in the propulsion community and continuing six decades of uninterrupted service to the field. The Johns Hopkins University will continue to provide administrative and technical support for JANNAF until an acquisition strategy is announced for the future structure of JANNAF operations. JANNAF does not anticipate any interruption to the conference schedule moving forward and is currently looking forward to hosting more than 400 people Albuquerque, NM this coming December.

Although change is afoot, rest assured that JANNAF will continue to operate decades into the future.

The Johns Hopkins University will also continue to operate the Chemical Propulsion Information Analysis Center (CPIAC) as a research center at the Whiting School of Engineering through the end of the year, at which time JHU will unveil a new name and expanded mission to take the organization into its next generation of service. All current ongoing research projects and task orders conducted by CPIAC will continue on at JHU through their planned period of performance using the contract they were initiated under.

What do these changes mean to you?

First and foremost, they mean continued and expanded access to world-class service in technical analysis through re-crafted and streamlined IAC and JANNAF programs. Second, they mean no interruption of service for the critical support that you get from these activities, including response to inquiries, access to databases, attendance at workshops and conferences, and all of the other services that have become so integral to the propulsion community.

What if I have a question about the capabilities of the new DSIAC?

Check the DSIAC website at www.dsiac.org, contact DSIAC directly at 443-360-4600, and watch for the DSIAC Journal coming out soon.

What if I have a question about a JANNAF conference?

Contact JHU/CPIAC at 410-992-7300 or check the JANNAF website at www.jannaf.org.

Will I need to do anything different to access the CPIN Propulsion Databases or JANNAF Propulsion Codes?

No, the propulsion databases will continue to be available through CPIAC and JANNAF from the current CPIAC homepage link at www.cpiac.jhu.edu, and the propulsion codes will continue to be managed for JANNAF by JHU/CPIAC.

What if I need a JANNAF paper or meeting proceedings?

Contact JHU/CPIAC at 410-992-7300. JANNAF papers and proceedings will continue to be available electronically in PDF format or on CD.

What if I need a document from the legacy CPIAC collection that isn't a JANNAF paper?

Contact DSIAC at 443-360-4600 or log on to the DTIC Gateway at www.dtic.mil/dtic/ for dynamic online access.

Who should I contact with my technical or bibliographic inquiry?

U.S. Government employees from JANNAF funding organizations (Army, Navy, NASA, and Air Force) should continue to contact JHU/CPIAC directly with inquiries. Industry, nonprofit, and academic organizations with active subscription accounts should continue to contact JHU/CPIAC directly with inquiries. Other U.S. Government organizations should contact DSIAC directly to establish proper credentials and initiate the inquiry.

In Memoriam

Robert L. Geisler

Mr. Robert L. Geisler passed away on February 20, 2014. Mr. Geisler graduated from the University of Cincinnati with a Bachelor's degree in Chemical Engineering in 1957. He was a leader in the solid rocket program at the Air Force Research Laboratory at Edwards AFB for 32 years before his retirement in 1990. Bob continued his work after retirement as a consultant and was considered a world-class expert on metal combustion, two-phase flow, nozzle recession, performance measurement and prediction and on solid propellants and motors in general. He had an in-depth grasp of the interplay of the multiple and complex technologies involved in full-scale, solid rocket motor development. He developed a broad spectrum of advanced solid rocket propellant ingredients and established in-house capability at the AFRL for precision performance measurement and prediction for advanced solid propellants.

Mr. Geisler was active on the JANNAF Interagency Propulsion Committee from the early 1970s. He has authored dozens of JANNAF papers, was a Program Committee Member for many of the early JANNAF Propulsion Meetings, served on countless JANNAF panels, and chaired JANNAF sessions, workshops and specialist sessions throughout this career. He also participated in the few "legacy" sessions held at JANNAF meetings to educate the younger community members on the "golden days of rocketry" to present his perspectives and personal anecdotes on the history of propulsion through an expanded discussion of milestones and enabling technologies. The JANNAF Combustion Subcommittee awarded him a "Sustained Contributions" service award in 2005. He is survived by his wife Evelyn; and three children, William, Anne, and Helen.

Robert C. Corley

Dr. Robert C. Corley, retired Senior Scientist with the Air Force Research Laboratory at Edwards AFB, CA, passed away on Sunday, March 23, 2014. After graduating from the Citadel in Charleston, SC, Bob was commissioned as a lieutenant in the U.S. Air Force. In 1958, he was assigned to the Rocket Site on Edwards AFB where he worked for three years before leaving the Air Force in 1961. Dr. Corley received a master's degree in chemistry from Duke University and a doctorate in chemistry from the University of California in Riverside. He eventually returned to Edwards for a civil service career in rocket propulsion with a specialty in chemistry and material sciences and retired as Chief Scientist. Dr. Corley, recipient of the Outstanding Civilian Career Service Award in 2000, was recognized as "one of the world's foremost experts on missile propulsion technologies. His research skills helped produce the extremely dependable solid fuel propellants that are used in almost all American tactical and ballistic weapons systems. His work also promoted our space program through booster systems development. The dependability of those systems is in large measure the result of his efforts."

Bob was also a major contributor to the JANNAF IPC. His first JANNAF paper is recorded back to the 2nd ICRPG Meeting held in 1967. In 1984, he became a member of the Combustion Subcommittee's Technical Steering Group, served on the JANNAF Executive Committee (EC) as a voting AF member from 1991 to 2000, and was EC Chair from 1994 to 1996. In 2009, he was presented with the EC Lifetime Achievement Award and served as the Contracting Officer's Technical Representative to the JANNAF support contract from 1994 to 1998. Although Dr. Corley initially retired in 2000, he returned to work, retiring again in 2011. Bob continued his JANNAF participation until his passing by contributing his expertise in JANNAF strategic initiatives. He is survived by his wife, Bee, of 54 years, his son Dan, and daughter Libby.

A Review of the 61st JANNAF Joint Propulsion Meeting

On May 19–23, 2014, the 61st JANNAF Joint Propulsion Meeting (JPM) was held at the Convention Center in Charleston, SC. Attendance topped 340 at this joint program with the 42nd Structures and Mechanical Behavior, 38th Propellant and Explosives Development and Characterization, 29th Rocket Nozzle Technology, and 27th Safety and Environmental Protection subcommittee meetings. Some 200 papers were presented in 40 technical sessions in addition to 6 workshops and specialist sessions, 7 working groups, 16 panel meetings, and 1 training course. The National Institute for Rocket Propulsion Systems (NIRPS), which had a strong presence at this JPM, sponsored several of the workshops and working groups that resulted from the launch of the new Programmatic and Industrial Base (PIB) Committee.

PROGRAMMATIC AND INDUSTRIAL BASE COMMITTEE

The PIB consists of a PIB Executive Committee separate from the JANNAF Technical Executive Committee, PIB working groups, and a PIB Senior Advisory Group. Some of its areas of interest include integrated program plans and key decision points; industrial base assessments; risks and opportunities with respect to skills, knowledge, and experience; identification of commonality, innovative acquisition, and partnership opportunities; integrated assessments to identify rocket propulsion industrial base rationalization opportunities; special actions from senior agency, department, or Executive Office of the President leadership; and information provided to decision makers for either situational awareness or policy decisions.

JOINT PROPULSION MEETING

The 61st JANNAF Joint Propulsion Meeting featured seven paper sessions and one workshop. The sessions offered 25 papers on topics such as missile system motors, combustion, and analysis; gun and gun-launched propulsion; propulsion system testing, demilitarization, and measurement; space launch missions and concepts; and propulsion modeling, simulation, and analysis. The National Institute for Rocket Propulsion led a workshop that discussed the activities and progress of the NIRPS discipline groups, provided demonstrations of NIRPS' secure Web portal, and presented some of the findings of recent rocket propulsion industrial base studies.

STRUCTURES AND MECHANICAL BEHAVIOR SUBCOMMITTEE

The 42nd Structures and Mechanical Behavior Subcommittee (SMBS) meeting held five paper sessions that presented 25 papers on the topics of material properties and characterization, service life and missile sustainment, structural analysis and design, and nondestructive evaluation. The SMBS's half-day training on margin of safety calculations based on the Guidelines for Determining Margin of Safety Calculations in Propellant Grains proved to be one of the most popular sessions. This publication (CPIAC PUB 612) presents guidelines for conducting structural analysis of solid rocket motor grains. The primary loadings considered are thermal cool down and ignition pressurization; response properties and failure criteria are also addressed. The guidelines are the result of a JANNAF SMBS effort to enable consistent approaches to margins determination in the industry. Frank Tse, chairman of the committee that drafted CPIAC PUB 612, presented an overview based on the publication, while other participants presented their views and cited some examples.

SMBS hosted, and ATK Launch Systems conducted a well-attended, two-day FEM Building and Hero Training session. The FEM Builder software program performs preprocessing, post-processing, and inter-processing functions for finite element modeling. FEM Builder also provides tools to solve multi-physics coupled finite element solutions. Hero provides heat transfer, pyrolysis, pore pressure, radiosity, mass transfer, accretion, and structural analysis. This training focused on four areas: (1) FEM Builder pre- and post-processing, (2) heat transfer analysis, (3) mass diffusion modeling, and (4) coupled fluid-thermal-structural interaction solutions with grain burn back. The training course received positive feedback, and if there are enough requests, it may be repeated in the future for those who were unable to attend this session.

PROPELLANT AND EXPLOSIVES DEVELOPMENT AND CHARACTERIZATION SUBCOMMITTEE

The 38th Propellant and Explosives Development and Characterization Subcommittee (PEDCS) meeting consisted of 105 papers in 21 sessions, six panel meetings, and a workshop. An additional 11 papers were presented in two joint sessions with the Safety and Environmental Protection

Subcommittee (SEPS). The papers discussed such topics as green energetic materials (the subject area shared with SEPS); the joint insensitive munitions technology program; insensitive propellants and explosives; explosive and propellant formulation, development, materials, and process engineering; solid propulsion technology for insensitive munitions; chemistry and aging; initiation and growth; guns and high gas output devices; and liquid propellants.

PEDCS hosted a short workshop entitled "Hydroxyl-Terminated Polybutadiene (HTPB): Critical Material Path Forward" that summarized current work to address issues related to the use of HTPB in the development of rocket propulsion and explosives systems. Another HTPB workshop and numerous others on various PEDCS topics are being considered for the next PEDCS meeting. A Joint Propellant Safety and Surveillance Board Meeting was collocated with this JANNAF PEDCS meeting.

ROCKET NOZZLE TECHNOLOGY SUBCOMMITTEE

General topics for the 17 papers presented at the 29th Rocket Nozzle Technology Subcommittee (RNTS) meeting included thrust control; innovative nozzle materials; thermal, structural, and fluid analysis and modeling; and nozzle design, test, and evaluation. Panel meetings discussed enabling technologies for thrust control, and nozzle design, analysis, and testing.

David Richardson of ATK Aerospace Systems chaired a workshop on the advanced thermal/structural modeling of carbon cloth phenolic to develop an industry-accepted, fully integrated coupled thermal and structural material model for accurate prediction of the response of heated phenolic material used in ablative thermal protection systems (TPS). These TPS materials are used on systems such as reentry vehicles and solid rocket motor nozzles. Currently many of the thermal/structural models have been empirically based involving approximations for the complex nonlinear nature of the material response of heated phenolic material. Most models have had a loose/independent coupling of the thermal and structural models. These models tend to produce overdesigned systems (particularly for man-rated systems). Past attempts have been unsuccessful due to the complexity of the modeling and the computer resource requirements. This task is now achievable with improvements in computer technology and the significant advancements made in numerous past historical studies. Historical efforts from previous investigators need to be combined into one finalized model.

This workshop sought to follow up on the status of analytical efforts that were conducted in response to the interagency code evaluation initiated at the last JANNAF RNTS conference. Participants shared the analytical evaluations of the predefined test cases and then discussed the shortcomings of the current industry standard analysis approaches. Technical discussions explored possible approaches to improve the standard techniques. A follow-on workshop is planned for the next RNTS meeting as well as a specialist session on the lessons learned from historical investigations of solid rocket nozzle behavior.

SAFETY AND ENVIRONMENTAL PROTECTION SUBCOMMITTEE

The 27th Safety and Environmental Protection Subcommittee (SEPS) meeting consisted of 25 papers in 5 sessions, 5 panel meetings, and 1 workshop. General topics presented included toxicology and occupational health; detection, demilitarization, and disposal of energetics; green energetic materials (joint sessions with PEDCS); and range and explosive safety. SEPS also held a successful workshop entitled "Fate, Transport, and Effects of Insensitive Munitions: Issues and Recent Data" that presented new information and data to assist in the planning and sustainable use of new insensitive munitions (IM) materials. The workshop featured presentations from the RDT&E and acquisition communities and reports from recent research conducted in the fate, transport, and effects of IM materials. Participants discussed critical research needs and outlined a path forward.

PROCEEDINGS

Proceedings of the 61st JANNAF Joint Propulsion Meeting, and Proceedings of the 42nd Structures and Mechanical Behavior / 38th Propellant and Explosives Development and Characterization / 29th Rocket Nozzle Technology / 27th Safety and Environmental Protection Joint Subcommittee Meeting, are forthcoming. Qualified customers may contact CPIAC at 410–992–7300 for more information or to order.

NIRPS Portal News

The National Institute for Rocket Propulsion Systems (NIRPS) has launched an online portal for use by the propulsion community. This portal provides a means for collaboration between the government, industry, and academia in a secure way. Development of the portal system is ongoing; however, as of today, it provides a critical service to JANNAF and the community at large. The four main features of the portal include a database of organizational skills and capabilities, small team collaboration spaces, wiki-like communities of interest organized around key technology areas, and access to JANNAF databases.

SKILLS & CAPABILITIES SEARCH RESULTS

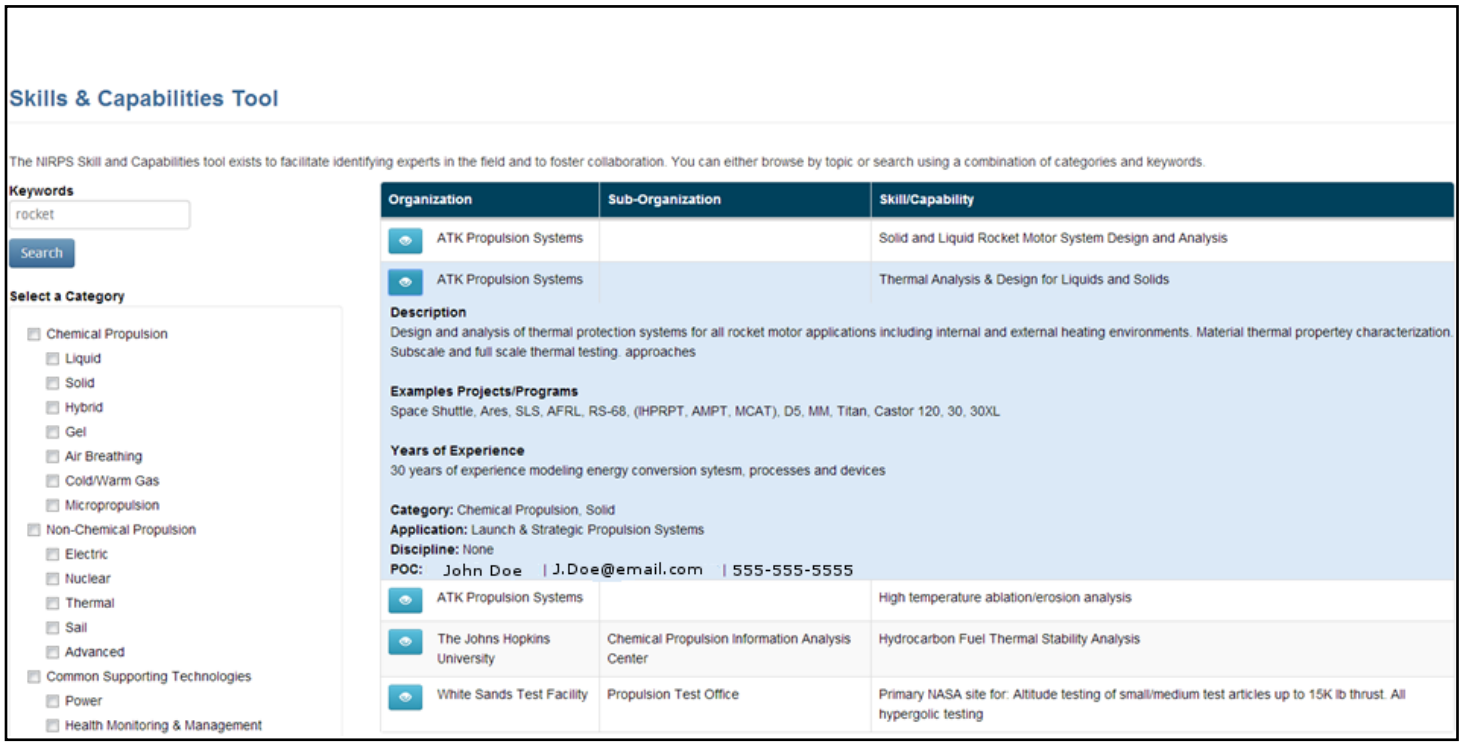
The skills and capabilities database is a user-populated database of key technologies, skills, facilities, and general capabilities of each organization. As of today, there are nine organizations listed in the database, including over 40 unique skills and capabilities. Users can search for specific skills in the database by using a keyword search or filter based on a hierarchy of technology areas. The primary goal of this system is to allow organizations to identify potential partners for collaboration and for individuals to be able to find and directly contact each other based on their areas of expertise. If you are interested in having your organization's information added to the database, please contact Nick Keim at nkeim@cpiac.jhu.edu.

SMALL TEAM COLLABORATION

The Small Team Collaboration section of the portal provides the ability for users to interact in small groups to tackle specific problems or tasks. Access to these groups is controlled by the leader of each team. The teams have access to their own mailing list, announcements, task list, and file sharing. The file sharing includes a check-out / check-in system for collaborative editing and automatically tracks file version histories. These teams can be available for all users of the NIRPS Portal or locked by the team leader to allow private collaboration among team members only.

COMMUNITIES OF INTEREST

The NIRPS Communities of Interest are a set of 23 groups organized around specific technology areas. These communities function similarly to the small team collaboration areas of the NIRPS Portal but are intended for all users to be able to participate. Users may create entries outlining specific, on-going activities or technology development pro-



NIRPS Portal Skills and Capabilities Database.

grams, post and needs or opportunities they may have associated with a particular technology, or add their best practices and lessons learned. The Communities of Interest will serve as a place to both archive knowledge so that it is easily located through the search capability and shared throughout the community, but also a means of industry- wide collaboration. In addition to the multi-user editable wiki entry system, each community contains a virtual library that can be populated by users with seminal papers and reference materials that are of critical importance to the community.

One of the current activities being pursued by NIRPS is the cataloging of important software codes used for propulsion system and vehicle design. Each of the codes identified will have an entry in the Analysis, Modeling & Simulation community of interest and describe the purpose of the code, license and distribution limitations for the code, as well as where and how to obtain a copy. This is just one example of the NIRPS Portal community space's ability to be able to capture knowledge and share it throughout the community in a secure way. Other potential uses of the NIRPS Portal include documenting best practices for Integrated Health Management (IHM) sensor utilization or disseminating the results of a specific technology development program through an entry describing the program and attaching key findings. The free-form and collaborative nature of the communities are particularly useful to JANNAF panels looking to document and share the results of their panel tasks.

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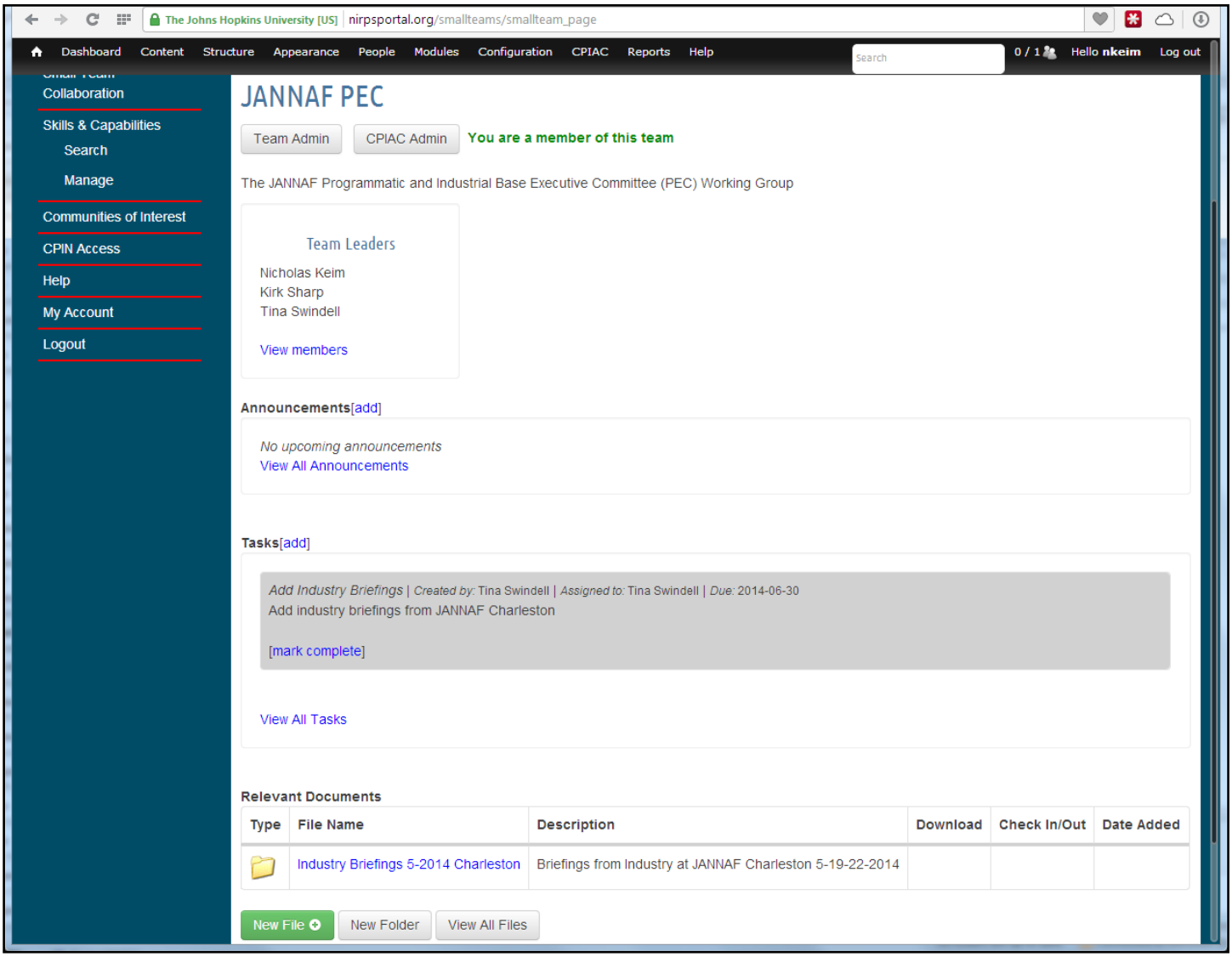

NIRPS Portal Small Team Collaboration Tool.

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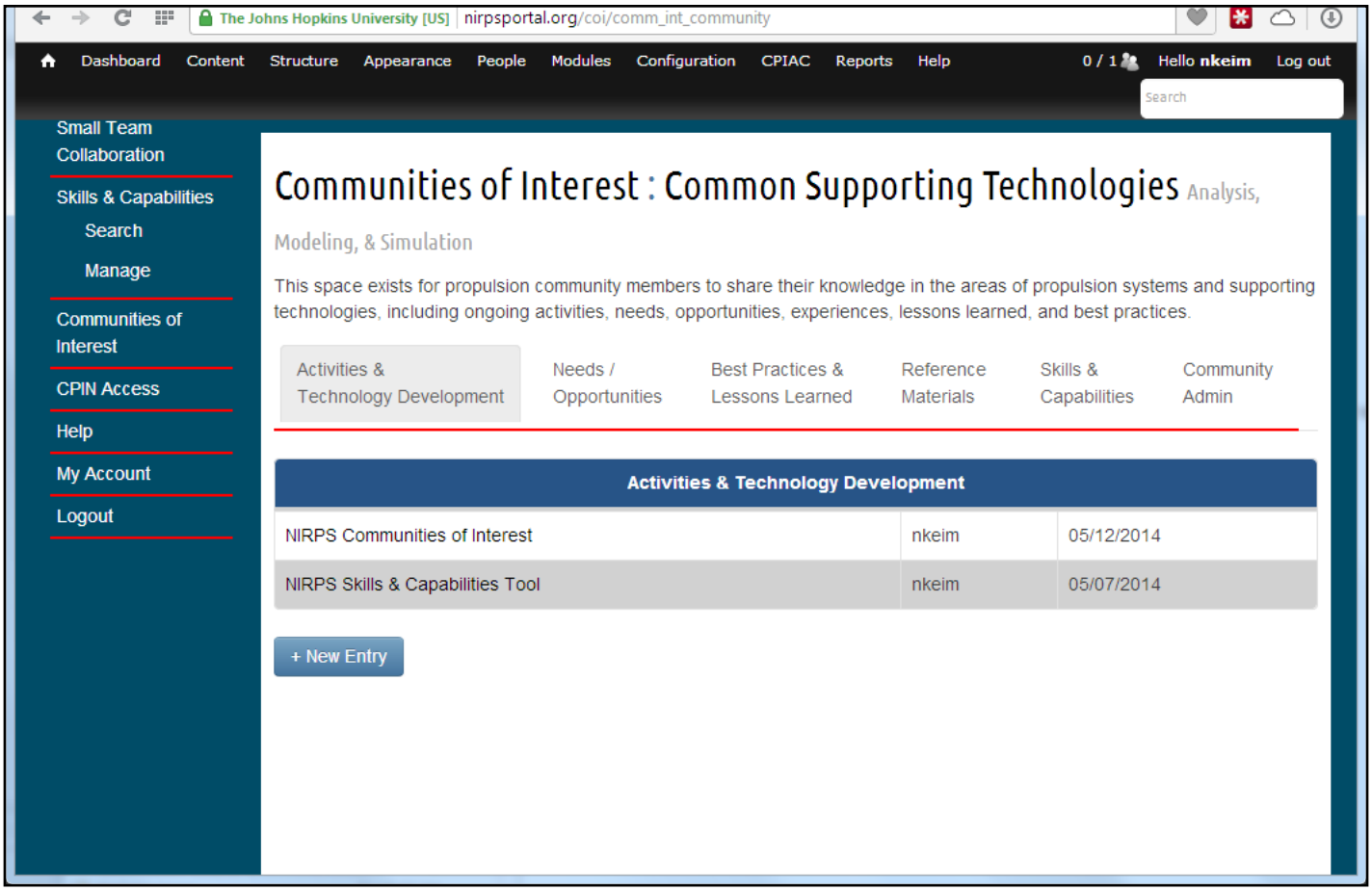

NIRPS Portal Communities of Interest.

In addition to the NIRPS developed databases and collaborative spaces, the NIRPS Portal serves as a single entry point to access JANNAF databases. The legacy user accounts for accessing JANNAF databases will be phased out in favor of the single-sign-on account used to access the NIRPS Portal (as well as the future secure JANNAF website). The switch to a single account is a stepping stone to future improvements to NIRPS and JANNAF electronic capabilities. One of these improvements currently under development is an improved JANNAF document library that includes full-text search capability and the ability to directly download documents. Scheduled to be launched early next year, the improved electronic library will greatly increase the ease and rapidity in which users can gain access to scientific and technical information presented at JANNAF, as well as other JANNAF and CPIAC publications.

To obtain a NIRPS Portal account, please go to the NIRPS Website: https://nirps.msfc.nasa.gov and click “collaboration logon” and create an account.

For more information on the NIRPS Portal capabilities and future plans, please contact Nick Keim at nkeim@cpiac.jhu.edu.

JANNAF Interagency Propulsion Committee Adopts Expanded Charter

The JANNAF Interagency Propulsion Committee recently received a new charter and is transitioning support requirements to its first dedicated contract. The charter, dated June 19, 2014, was signed by Frank Kendall, Undersecretary of Defense for Acquisition, Technology and Logistics, and Robert M. Lightfoot, Jr., Associate Administrator of the National Aeronautics and Space Administration (NASA).

In addition to the continuation of JANNAF's full suite of technical activities, the new charter includes a Programmatic and Industrial Base (PIB) committee whose interests will be in the areas of integrated program plans and key decision points; industrial base assessments; risks and opportunities with respect to skills, knowledge, and experience; identification of commonality, innovative acquisition, and partnership opportunities; integrated assessments to identify rocket propulsion industrial base rationalization opportunities; special actions from senior agency, department, or Executive Office of the President leadership; and information provided to decision makers for either situational awareness or policy decisions. The JANNAF PIB will report to the newly formed Programmatic Executive Committee.

The current JANNAF Executive Committee will continue operations and henceforth be known as the Technical Executive Committee (TEC). The charter lists the following technical areas covered by the TEC and its associated subcommittees: chemical synthesis; thermochemistry; combustion phenomena; physical, chemical, and mechanical properties and manufacturing process development of propellants, explosives, and fuels; special test equipment and techniques; theoretical and experimental performance; analytical test techniques; component and propulsion unit design; nondestructive evaluation; operational serviceability; life-cycle costs; reliability; environment protection; exhaust plume technology; interior ballistics; material areas specifically related to missile, space, and gun propulsion; and the evaluation of hazards and safety measures related to these areas.

Additionally, NASA has taken the lead to commission a "dedicated" contract for administrative and technical support of JANNAF operations (in both the technical and programmatic areas). While JANNAF (and its predecessor organizations) has been operating since the 1940s, contract support for the organization has always been structured as a line item to DoD contracts, as most recently with the operation of the Chemical Propulsion Information Analysis Center, contracted through the Defense Technical Information Center. NASA announced this new structure in Federal Business Opportunities (FedBizOpps) on September 10, 2014, as well as its intention to select the Johns Hopkins University (JHU) Whiting School of Engineering to provide these services through a sole-source award. JHU has provided technical and administrative support to JANNAF and its predecessors since 1946.

To review the complete charter, please visit the link from the JANNAF homepage at: https://www.jannaf.org/node/45.

JANNAF Journal Call for Papers- Volume 8!

Contact

Journal Managing Editor Kristina Baker at **kbaker@cpiac.jhu.edu** for more information.

JANNAF to Host Inaugural Sessions on Homemade and Improvised Explosives Research

For the first time, JANNAF will sponsor a full day of Improvised and Homemade Explosives Research presentations to foster collaboration and community building at the December 2014 JANNAF Conference. Explosives laboratory and handling safety depend on a strong community and the willingness of its members to share information, resources, and lessons learned. Because of the unpredictable nature of explosives, researchers are still discovering new behaviors and reactions of even the most studied explosive compounds.

There will be two sessions related to the study of Homemade Explosives on December 10. At the morning session, "Combatting a Global Threat: Advances in Improvised and Homemade Explosives Research," members of academia and industry will present new research focusing on the sensitivities of these materials and methods to counter the threat they pose.

The second session, "Strength in Numbers: Building a Safer Improvised and Homemade Explosives Community," to be held on the afternoon of December 10, will highlight the need for unconditional safety when working with homemade and improvised explosives. Collaboration among a strong community of researchers willing to share resources and information is imperative to achieving this level of safety for all who work in the field.

Speakers throughout the day will include Dr. Kirk Yeager, FBI; Jimmie Oxley, University of Rhode Island; Dr. Steve Son, Purdue University; Melissa Candelaria-Lyons, New Mexico Tech University; and members of U.S. agencies involved in explosives research, including the U.S. Department of Homeland Security.

In Memoriam

Notification was received from Mr. Curtis Johnson of Blue Origin that his mentor, Mr. Gary R. Nickerson, had passed away in March 2014. Mr. Curtis was quoted "Gary was my mentor and had a huge impact on my career. He was involved in rocket propulsion since the start of his career in the early 1950's. Gary had a true passion for rocket propulsion and for learning in general. He always had a positive attitude and a good story to tell. His work in rocket propulsion, especially the SPP and TDK computer codes and nozzle performance, were extremely well known in the rocket propulsion business and had a major impact in propulsion design."

Mr. Nickerson's participation in JANNAF began back to 1969 with a paper in the 5th Interagency Chemical Rocket Propulsion Group Combustion Conference and continued through the year 2002. His work was foundational in the development of the Solid Propellant Rocket Motor Performance Prediction Computer Program (SPP) that provides a method to predict the average delivered peformance, as well as mass flow, pressure, thrust, and impulse as functions of time; and, the Two Dimensional Kinetic (TDK) code used as a primary tool in applying the JANNAF liquid rocket thrust chamber performance prediction methodology.

Gary R. Nickerson

In Memoriam

Richard J. Priem passed away on December 25, 2013 at the age of 86. Mr. Priem served as Head of the Rocket Combustion Section from 1958 to 1980 at the NASA Lewis Research Center (now known as the NASA Glenn Research Center) in Cleveland, OH. His career spanned over 60 years of involvement with NASA development efforts.

He was known as a "lively" NASA member of Technical Steering Group of the Combustion Subcommittee (formerly known as the Combustion Instability Working Group and the ICRPG Solid Propellant Combustion Group) from 1962 to 1971. This first JANNAF paper was published in the 3rd Joint Army-Navy-NASA-ARPA Liquid Propellant Group Meeting in 1961. He is survived by his wife and five children.

Richard J. Priem

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Volume 8

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Volume 7, Issue 1 of the *JANNAF Journal of Propulsion and Energetics* Available Summer 2015!

Volume 7, Issue 1 of the *JANNAF Journal of Propulsion and Energetics* will be released this spring and distributed at the June 2015 JPM in Nashville, TN. The issue features papers in the areas of electric propulsion, hypersonic propulsion, liquid propulsion, energetics and reactive materials, and solid propulsion technologies.

A special issue (Volume 6, Issue 2) devoted to hypersonic air-breathing propulsion topics is scheduled to be released in December of 2014. Manuscripts are currently being accepted for consideration in Volumes 8 and 9. For questions about manuscript style or preparation, figures and graphics, submission procedures, and deadlines, please contact Journal Managing Editor Kristina Baker at kbaker@cpiac.jhu.edu. For matters related to technical topics, special focus areas, research, and data, please contact Technical Advisor David Owen at JournalTA@cpiac.jhu.edu.

Recent CPIAC Products and Publications

JSC CD-70, *45th Combustion / 33rd Airbreathing Propulsion / 33rd Exhaust Plume and Signatures / 27th Propulsion System Hazards Joint Subcommittee Meeting*, December 2012

JSC CD-71, *Classified Papers from the JANNAF 33rd Airbreathing Propulsion / 33rd Exhaust Plume and Signatures Joint Subcommittee Meeting*, December 2012 (U)

JSC CD-72, *9th Modeling and Simulation / 7th Liquid Propulsion / 6th Spacecraft Propulsion Joint Subcommittee Meeting*, May 2013

JPM CD-12, *60th JANNAF Propulsion Meeting*, May 2013

JSC CD-74, *Liquid Propulsion Subcommitte (LPS), Advanced Materials Panel (AMP), Additive Manufacturing for Propulsion Applications Technical Interchange Meeting (TIM),* September 2014

May 2014 JANNAF Meeting Collage

Calendar of JANNAF Meetings

46th CS/ 34th APS / 34th EPSS / 28th PSHS: December 8–12, 2014

Hyatt Regency Albuquerque, Albuquerque, New Mexico

Deadlines:

Nov 10	Papers and paper clearance forms due to CPIAC
Nov 24	Presentations due to CPIAC
Dec 2	Registration forms due. Deadline for discounted registration fee of $900; after November 24th, the fee is $1,050

For additional information and registration, please visit:
https://www.jannaf.org/mtgs/Dec2014/pages/index.html

62nd JPM / 10th MSS / 8th LPS / 7th SPS: June 1–4, 2015

Nashville, Tennessee

Deadlines:

Jan 16	Deadline to submit JPM abstracts
Mar 30	Deadline for award nominations
Mar 30	Deadline to submit student paper award nominations
Apr 20	Deadline for changes to final program
Apr 21	Papers and paper clearance forms due to CPIAC
TBD	Deadline for hotel reservations
May 18	Registration forms due. Last day for discounted registration fee. Presentation due to CPIAC.

For additional information and registration, please visit:
https://www.jannaf.org/mtgs/June2015/pages/index.html

42nd SMBS / 39th PEDCS / 30th RNTS / 28th SEPS: December 2015

Location TBD

For additional information on the above JANNAF meetings, contact CPIAC at 410-992-7300 and ask for Shelley Cohen.

Visit the JANNAF website for meeting updates: www.jannaf.org

Policy on Non-Government Attendees at JANNAF Meetings: Attendance is restricted to invited U.S. citizens. Non-government attendees must have their employment confirmed with an organization certified with the Defense Logistics Agency (DLA) to obtain export-controlled technical data AND be certified by a sponsoring government official from one of the participating JANNAF agencies. To attend the classified sessions, attendees must also possess a personal security clearance of at least Secret with a need-to-know in the areas of rocket, missile, space, aircraft, or gun propulsion. Information concerning registrations with DLA can be obtained by contacting DLA at (800) 352-3572 (www.dlis.dla.mil/jcp/). Questions concerning attendance eligibility should be directed to the CPIAC Facility Security Officer, Mary Gannaway, at (410) 992-7304, ext. 211.