

Invitation and Travel Information

19th International Workshop on the Holistic Structural Integrity Process (HOLSIP)

The ever-increasing demands on engineered structures require advanced materials and fabrication techniques to enable structures to reach and maintain desired levels of performance and reliability.

Simulations of physics based structural degradation and failure modes have recently been developed that enhance the life assessment methodologies available to industry for both design and sustainment. It is now possible to quantify the effects of intrinsic physical discontinuities and of particularly severe conditions, such as fatigue, corrosion, and wear on structure.

These advancements will help enable industry to shrink the gap between safe-life and damage tolerance lifing methodologies and meld the two into a unified HOListic Structural Integrity Process capable of positively impacting all aspects of safety, cost, and availability. These advancements are relevant to all industries, including aerospace, nuclear, and civil infrastructure.

Dear Colleague,

We would like to invite you to participate in the 19th International Workshop on the Holistic Structural Integrity Process (HOLSIP) to be held February 10-13, 2020 at the Snowbird Ski and Summer Resort near Salt Lake City, Utah.

The goals of this Workshop are:

1. to capture the progress in the development of relevant methodologies and technologies,
2. to identify the technology and requirements gaps that need to be filled to advance HOLSIP to a state where it will be widely recognized for its cost saving potential while improving safety, and
3. to determine the criteria and requirements that need to be developed for the implementation of HOLSIP.

If you would like to participate in the workshop, or if you are unable to attend and would like to nominate another person from your organization to take your place, please reply to Kimberli.Jones.1@us.af.mil by 2 December 2019.

The Organizers:

David Forsyth
TRI /Austin
Kimberli Jones
USAF/AFLCMC

Paul Clark
SwRI
Min Liao
NRC Canada

Workshop History

For the past nineteen years, representatives from various countries including the United States, Canada, Poland, Japan, the United Kingdom, Australia, the Netherlands, and Germany have met to discuss the development of an evolving physics-based life methodology, known as the Holistic Structural Integrity Process (HOLSIP). A variety of representatives have attended these workshops including people from government agencies (for instance, National Defense organizations), commercial organizations, academics and maintenance providers so that the appropriate requirements could be included in this life methodology. See www.holsip.com for more information.

Workshop Technical Goals

HOLSIP contains methods that take into account both cycle and time dependent environmental effects in assessing structural life and residual strength capability, with the ability to account for time in and out of operation. In the application of HOLSIP to metals, the life of a component is divided into four distinct phases: nucleation, short crack, long crack, and final instability.

HOLSIP is developed to augment and enhance traditional safe-life and damage tolerance paradigms to provide a powerful design and sustainment tool. As a design tool, it is capable of determining the life cycle of a structure from the early stages of damage formation to final failure by encompassing material selection, structural design, manufacturing procedures, and inspection and maintenance requirements. As a sustainment tool, HOLSIP can be applied at any stage during the service life of an aircraft when damage is detected or fleet usage and operational variations are encountered.

The basic material microstructure and surface integrity resulting from the manufacturing process are built into the physics-based models in HOLSIP in conjunction with other intrinsic and extrinsic factors such as residual stress from cold working and laser peening, environmental/chemical exposure, maintenance/accidental damage, and age degradation in service. Probabilistic techniques are used in HOLSIP to account for the uncertainties of material, manufacturing, loading, and inspection.

Workshop Session Organization and Themes

If you would like to lead a discussion or give a presentation, please contact a member of the organizing committee. The workshop will be loosely organized into the themes below. Each discussion/presentation will have a large assigned time slot to encourage the exchange of ideas and open questions that have been a key feature of HOLSIP meetings past. These facilitated discussions and presentations will encourage the spirit of dialogue and learning that separates this Workshop from conventional conferences.

Workshop Themes

- HOLSIP Applications
- Composites and Hybrid Structures
- Metallic Materials
- Health and Usage Monitoring
- Digital Twin/Digital Thread/Virtual Testing
- Nondestructive Testing
- Structural Integrity

Regulatory Challenges
Residual Stress
Risk Assessment

Workshop Location and Schedule

The location for this year's workshop is Snowbird Ski and Summer Resort near Salt Lake City, Utah.

The schedule is for the conference to open Monday morning (February 10), and finish Thursday (February 13) in the evening. Attendees are encouraged to arrive Sunday (February 9) and depart Thursday evening (typically after 7 PM, February 13) or Friday (February 14) in order to fully participate. A welcome reception/dinner will be held Sunday night from 6:30-9 PM.

Formal sessions will be held each day approximately from 7:00 AM to 11:30 AM and from 4:00 PM to 7:30 PM. One day (February 12) will be designated as USAF Aircraft Structural Integrity Program (ASIP) day, with the meeting schedule planned to go from 8:00 AM to 5:00 PM (working lunch included). In the afternoons on other days, attendees are encouraged to participate in break-out sessions and social networking. Please note that the dress code for all events is casual.

Potential discussion topics include:

- HOLSIP overview and future direction
- Risk assessment
- Residual stresses due to surface enhancement
- Structural Health Monitoring
- Fatigue crack modeling of cold-worked holes
- Ideas on how to incorporate HOLSIP into current Aircraft Structural Integrity Programs
- HOLSIP plans related to non-aircraft implementation

If you would like to lead a discussion or give a presentation, please let a member of the organizing committee know, and provide a title and/or topic area. *Presentations should include why the subject is related/applicable to HOLSIP.* Organizers reserve the right to reject presentations previously given if there have been no new developments. All participants are encouraged to contribute through the workshop's discussions.

A basic outline of the workshop is provided. This is subject to change, based on attendee presentations.

charges assessed due to unforeseen circumstances or death, injury, or illness to the guest, or traveling companion. Insurance must be purchased at time of booking room reservation.

We ask that you provide an indication of your interest as soon as possible to facilitate conference planning. Finalized room lists are required by Monday, December 23, 2019. After this date, rooms at the Lodge at Snowbird are not guaranteed.

Please contact Kim Jones at 1-801-777-3887/Kimberli.Jones.1@us.af.mil to respond to this invitation or if you have any questions.

Additional Workshop Information - Lodging

Snowbird Ski and Summer Resort's website is <http://www.snowbird.com/>

RESERVATION DUE DATE: Lodging room reservations should be received by **December 23, 2019**, after which date all unsold rooms remaining in your room block will be returned to Snowbird's inventory for sale to the public. Reservations received after the due date or exceeding your contracted room block will be accepted on a space available basis. At Snowbird's discretion, group rooms and rates may be extended to assist the Group in reaching the lodging room commitment as outlined in the Performance/Attrition clause of this contract. After the due date, should room type(s) listed in your contract no longer be available, Snowbird will offer alternate room types from our remaining inventory which may require a higher rate.

ROOM CHARGES--Individuals Pay All Charges: Individuals will be responsible for payment of their own lodging, taxes and fees, additional nights and incidental charges at time of check-out. A credit card imprint will be taken at time of check-in.

LODGING DEPOSIT for Individuals: A **two-night deposit** per room is required at the time the reservation is made. Room and tax for the entire stay is required 30 days prior to arrival. If full payment is not received, the rooms will be returned to Snowbird's inventory, though this shall not release or reduce the Group's liability for attrition or cancellation damages.

LODGING CANCELLATIONS: The individual reservation lodging deposit is fully refundable up to thirty (30) days prior to the arrival date. Reservations cancelled 29-15 days prior to the arrival date will be charged two (2) night's lodging and tax. Reservations cancelled within 14 days prior to the arrival date are fully non-refundable. **No-shows, delayed arrivals and early departures are considered cancellations.**

CHECK IN/OUT: Check-in time begins at 4:00 p.m. and is guaranteed by 6:00 p.m. Check-out time is 11:00 a.m. Luggage storage is available through bell service for guests arriving prior to check-in time and for those involved in meetings or activities that extend past check-out time. Photo ID is required at check-in along with a credit card or cash deposit for incidental charges. Debit cards are not recommended.

All unreserved portions of the guestroom block will be released on **Monday, December 23, 2019**.
Rooms may be available after that time, but are not guaranteed.