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A Network Collaborative Design Construct for the Dissemination of Aviation Safety Research

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Abstract

The constructs for collaborative network building include common tenets for the establishment of communication channels not only within the network but for constituencies external to the network. These constituencies are beneficiaries of the resulting knowledge which emerges and is disseminated. The Safety Across High-Consequence Industries (SAHI) conference was formed in 2003 for the purpose of bringing together safety leaders from multiple fields within the high consequence industries of healthcare, nuclear power, aviation, and others. Through SAHI four multinational conferences have been convened and resulted in bodies of safety knowledge available through widely distributed proceedings. In the process of generating and establishing the SAHI conference, an informal collaborative network of industry and academic leaders was formed with the goal of enhancing industry safety. Originating as an informal grouping of concerned parties, this collaborative network has evolved through several iterations and is currently being built around a more structured, technologically-based networking solution that formalizes the relationships and advantages that have been built through the previous generations of network collaboration. The next steps in this maturing evolution include the founding of the International Journal of Safety Across High-Consequence Industries and the formal establishment of the SAHI Collaborative Network. This paper serves the purpose of chronicling the development of SAHI and establishing the foundation for the launch of the International Journal of Safety Across High-Consequence Industries as a component of the National Center for Aviation Safety Research.

Development of the SAHI Collaborative

Several years ago, researchers from the health care and aviation industries wondered whether there were any safety best practices that could be transferred from aviation to health care. As the discussion evolved, the idea of a multidisciplinary conference focused on bi-directional transfer of best practices was born. In March 2004, Saint Louis University took the leadership role in hosting the first conference on Safety Across High-Consequence Industries (www.parks.slu.edu/sahi) with a goal to connect aviation, health care, industrial safety and other critical-incident industries. The founding organizers of SAHI: Jeff Brown, Tom Bigda-Peyton, Lou Halamek, Jim Bouey, and Manoj Patankar envisioned a forum for effective scientist-practitioner integration with regard to safety research and the role this type of social collaborative network could play in promoting safety.

The Safety Across High-Consequence Industries (SAHI) conference brings together professionals from the medical, public health, and aviation industries to discuss solutions to current challenges and directions for future research in safety. Convened every 18 months, the conference promotes cross-industry discussions of safety and a balanced, scientist-practitioner approach to addressing safety issues. Of significant importance, the SAHI conference is designed to provide a unique forum for researchers and

In a review of the most recent SAHI conference, Block and Bigda-Peyton (in press) identified the most critical safety concerns facing high-consequence industries. Conference attendees noted several key issues affecting safety: the need for improved understanding of open-systems interactions; the role of organizational culture in safety attitudes and behaviors; the importance of various approaches to organizational change management and their impact on long-term change sustainability; and the role of interpersonal communication in affecting the success of safety efforts. In consideration of these critical issues, researchers with the National Center for Aviation Safety Research and the Department of Aviation Science at Saint Louis University began formal development of the SAHI Collaborative Network.

Establishing a Formal Network Structure for the SAHI Collaborative

Collaborative networks are formed to bring together synergistic relationships for the purpose of provisioning an optimal foundation from which to pursue common goals. (Metz, 2007). Many collaborative networks begin through an informal or ad hoc gathering of parties based on common interests. Such was the case for SAHI until the introduction of structure to optimize and expand upon the initial successes. The formalized concept of a collaborative network for SAHI originated from work by Bowen and Lu (2004) on the development of the policy research construct. Within that exploration, Bowen and Lu conceived a process representation that allows for a methodological representation of a working construct for the purpose of building a model for applications in an environment such as SAHI. Through the application of the policy research construct and the research by Metz, the idea of a formalized SAHI collaborative network was generated. To operationalize this concept, Block conceived elements that would form an organizational structure to provide a sustainable and viable entity. (Bowen & Block, 2008)

Today the Safety Across High-Consequence Industries Collaborative Network has been established as an international collaboration with more than 100 active participants. Members and potential members are primarily to be found among safety leaders in various organizations, safety researchers at other institutions, and members of government offices concerned with safety. Joining the founding group, an organized core of multidisciplinary professionals brought further vision to the SAHI concept. These include Psychology (Sabin and Block), Business (Van Slyke and Miller), Aviation Education (Bowen and Kelly) among others. The resulting evolved Network provides members opportunity to interact and share ideas through participation in a knowledge-exchange forum for researchers and practitioners. This (primarily) electronic network further allows members to seek assistance with safety issues, share best practices, and engage leaders and researchers across industries in improving safety.

The Network centers on the 12 key contributors to the SAHI conferences, who serve as an active steering committee providing guidance and oversight for the conference and the activities of the Network. General membership in the Network is voluntary and is generally extended at the request of the potential member. At certain times the active steering committee may encourage particular researchers or safety leaders to join the Network if they have not done so. Members and potential members are primarily to be found among safety leaders in various organizations, safety researchers at other institutions, and members of government offices concerned with safety. While the primary focus of the National Center is on aviation safety research, the practical focus of the Network encourages interest and effort across high-consequence industries such as health care, nuclear power, environmental, as well as aviation.
Transition from Informal to Formal Network Accelerated by a National Research Center

The SAHI Collaborative is a key element of the recently established National Center for Aviation Safety Research (NCASR or National Center) at Saint Louis University. Improving safety in high-consequence industries continues to be a significant priority for both industry leaders and safety researchers (Block & Bigda-Peyton, in press). The Safety Across High-Consequence Industries Network Collaborative is thus established to be an extension of the National Center. The National Center has been crafted to be a dynamic organization which can transform and adapt to changing national priorities in aviation safety research focused in the areas of:

2. Safety Culture
3. Multi-risk Assessment
4. NextGen Safety Assessment
5. Incident Investigation
6. Maintenance Aviation Safety Action Programs

The goal of the National Center for Aviation Safety Research at Saint Louis University is to serve as the central resource for practitioners, researchers, and consultants to develop sustainable safety initiatives across air transportation, as well as other high-consequence industries. The National Center will sponsor experimental as well as applied/action research in aviation, health care and other high-consequence industries; publish a globally disseminated research journal; host the Safety Across High-Consequence Industries Conference; and develop specific training programs for multiple industries. (National Center, 2008).

Elements and Activities of the Maturing SAHI Collaborative

The goal of the Collaborative Network is to promote effective scientist-practitioner integration with regard to safety research. To accomplish this goal, efforts of the Collaborative Network are structured around 3 functions: 1) as a link between SAHI key contributors and industry/research leaders in safety; 2) as an entry mechanism for incorporating new industries and organizations into safety discussions and participation; and 3) as an outreach to industry, government, and the scientific community that is focused on aviation safety practices, but is firmly based in aviation safety research and draws from research of the NCASR. Specific industry partners such as airlines, air traffic control facilities, aviation maintenance organizations, health care facilities, nuclear power plants and others serve as the field sites for research. Lessons learned from one industry may be tested for transferability into another industry to maximize the benefits of multidisciplinary research and development efforts. (Parks, 2008)

In connection with the three functions of the Collaborative Network, a significant number of Network activities will focus on promotion of, and attendance at, the international Safety Across High-Consequence Industries conferences. These conferences are an ideal time for Network members to interact and share ideas with key contributors, to invite industry leaders to attend in hope of their future participation in the Network, and to outreach in promotion of the scientist-practitioner approach to safety program initiatives. In between conference meetings, members will publicize the work of SAHI and National Center in their organizations and encourage other organizational leaders concerned with safety to participate in the Collaborative Network through active, topical working groups. (Bowen & Block, 2008)

In addition to these activities, Network members are expected to participate in a knowledge-exchange forum for researchers and practitioners. This (primarily) electronic forum allows members to seek assistance with safety issues, share best practices, and engage leaders and researchers across industries in
improving safety. Network members will have an opportunity to engage colleagues/researchers in an ongoing dialogue on relevant safety issues. This approach moves safety-critical discussions beyond the approximately annual meetings of the SAHI conference into the realm of a constant, iterative process of safety improvement. By participating in an electronic collaborative entity, Network members will be able to truly share information in a real-time format that encourages peer-to-peer learning; this truly embodies the key message of the fourth SAHI conference, in which industry safety leaders agreed that they “don’t compete on safety.” (Patankar, 2008)

Participants in the SAHI Collaborative will include a cadre of academic fellow appointees for the purpose of participation in graduate education. These fellows will form the nexus of multidisciplinary clusters that facilitate graduate seminars within Parks College. It is envisioned that fellow clusters will emerge in each area of SAHI focus. These areas include aviation, healthcare, power generation and transmission, and other high-consequence fields with a common core element of safety systems management. (Bowen, Lehrer, Patankar, & Block, 2008).

Research Dissemination Through Creation of a Multi-national Journal

In addition to the SAHI Collaborative Network, the National Center has launched, with world-wide and well-established expertise, the International Journal of Safety Across High-Consequence Industries (IJSAHI). The goal of the Journal is to cross boundaries so that overall systemic safety can result through the integration of research and industry practice. The foundation relationships and targeted outcomes are represented in an open conceptual design construct with intent to foster diverse membership growth and dissemination of aviation safety research world-wide. Initial foci include but are not exclusively limited to, the following fields: Aviation, Engineering, Health Care, Manufacturing, Nuclear Power, Security, Technology, and Transportation. Topical areas covered include:

- Systems Safety: Research and Practice, Scientific Process, Strategies, Initiatives & Outcomes
- Advanced Technology Systems: Design, Technology Integration & Improvements, Forecasting, Information Systems, Data-mining
- Culture: Ethics, Business, Management, Regulation, Safety Systems and Society, Policy Development & Implementation
- Human Factors: Engineering, Logistics, Collaboration, Simulation, Risk Management & Mitigation
- Education: Training, Communication, Learning Styles, Psychology, Case Study, Reporting Systems, Information Transfer & Collaboration
- Economics: Fiscal Implications, International Relations

Through the journal, a global network of aviation safety research dissemination has been created, to be linked electronically in an environment that fosters ongoing collaboration in addition to the multinational conference meetings. The inaugural issue of The International Journal of Safety Across High-Consequence Industries was launched in Spring 2009 at the International Symposium on Aviation Psychology. (Bowen & Fink, 2008)

Conclusion

The SAHI Collaborative Network and the IJSAHI will contribute to meeting the ongoing research and educational goals of the National Center for Aviation Safety Research. An action research model is employed to extract data, conduct modeling, and develop concepts for deployment and dissemination under the National Center’s direction. The research results will continuously feed back to the programs of
the NCASR and subsequently improve systemic safety. Development of both the Collaborative Network and the IJSAHI are innovative methods for creating a cross-industry focus on safety that moves beyond basic processes to incorporate system-wide issues. Participation in both the Collaborative Network and the IJSAHI by academic and industry community members is welcomed and encouraged. (Block & Bigda-Peyton, in press). Through Network participation critical issues will be addressed and result in effective scientist-practitioner integration with regard to safety research. The Safety Across High-Consequence Industries Collaborative Network will continue to bring together professionals from the medical, public health, power and aviation industries to discuss solutions to current challenges and guide directions for future research in safety.

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References


