COMMITTEE CHARTER
SAE AISC-SHM
Aerospace Industry Steering Committee on Structural Health Monitoring
Version 2.2
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ARTICLE I – CHARTER

Section 1 – Introduction

Structural Health Monitoring (SHM) technologies are currently being evaluated by commercial and military OEM and regulators as a means for satisfying scheduled and non-scheduled inspection / maintenance tasks in aerospace, civil and mechanical structures for purpose of reducing their operation and maintenance costs with the same or better safety and reliability standards. Once adopted, SHM will need to satisfy continued airworthiness requirements. SHM technologies are perceived as a revolutionary method of assessing the integrity of structures involving the use of multidisciplinary fields such as sensors, materials, signal processing, system integration and signal interpretation. The core of the SHM technology is the development of automated systems utilizing distributed sensor/actuator networks permanently integrated into structures for monitoring, inspection and damage detection of the structures with minimal labor involvement. The aim of SHM is not only to detect structural discrepancies and determine extent of damage, but also to determine effects of structural usage and provide an early indication of physical damage. The early warning provided by an SHM system can then be used to define remedial strategies before the structural damage impacts continued airworthiness.

Owing to the growing demand from the aerospace industry for procedures of standardization and implementation of Structural Health Monitoring (SHM) technologies, it is proposed to create an Aerospace Industry Steering Committee (AISC) for Structural Health Monitoring. This charter is developed based on the discussions, which took place at the 3rd European Workshop on Structural Health Monitoring among industrial participants, July 5-8 of 2006, Granada, Spain, and the meeting minutes resulting from the first SHM-AISC board meeting took place at Stanford University on Nov. 7, 2006. The purpose of this charter is to document and communicate the vision, mission, membership, roles, and responsibilities of the SHM-AISC.

Section 2 - Purpose of the Committee

The SHM-AISC is a team comprised of industrial, government, and academic participants with a collective vision to efficiently and effectively implement structural health monitoring for a wide variety of commercial and military applications through the development of standards, procedures, processes and guidelines for implementation and certification of the technologies.
The SHM-AISC’s roles and responsibilities include:

- Define and maintain the charter for the working groups to be consistent with the SHM AISC mission statement.
- Approve the proposed initiatives for the working groups to be consistent with the SHM AISC mission statement.
- Create working groups and involve all necessary organizations to initially carry out the following:
  - Review qualification and certification processes and procedures for various regulatory agencies such as the FAA and EASA.
  - Develop guidelines for use by regulatory agencies to generate new or revise existing certification requirements (including advisory materials).
  - Review existing scheduled/unscheduled maintenance and structural inspection practices/processes and identify opportunities for implementation of SHM.
  - Set Guidelines for developing standards for assessing the reliability and maintainability of SHM.
  - Evaluate and recommend changes to design practices to identify opportunities for implementation of SHM.
  - Standardize terms for SHM and initiate a “dictionary.”
  - Promote utilization of SHM.
  - Promote participation of industry/government organizations.

Section 3 – Objectives.

The mission of the SHM-AISC is to provide an approach for standardizing integration and certification requirements for SHM of aerospace structures, which will include system maturation, maintenance, supportability, upgrades and expansion. The final goals will be to develop a guidebook specifying approach for SHM usage on Air and Space vehicles and to identify technology gaps leading to SHM utilization.

Section 4 – Scope

The following classes of air vehicles and related equipment and platforms may be considered either separately or grouped as appropriate for the specific purpose:

a. Civil fixed and rotary wing air vehicles
b. Military fixed and rotary wing air vehicles
c. Unmanned fixed and rotary wing air vehicles

The scope of the committee is to accumulate, develop and disseminate SHM system technology and experience relating to the above groups. While aspects pertaining to space systems are not specifically included, the committee’s scope could be expanded to include space should the need or demand so require.
Section 5 – Committee Representation

Committee membership should consist of representation from the following entities and include representation from both civil and military sectors:

- OEMs
- Tier 1, Tier 2 Systems Integrators and Suppliers
- Regulatory Authorities / Government Agencies
- End Users (Operators/Maintenance Organizations)
- Academic and Research Institutions
- Technology providers (including small businesses)
- Other persons with applicable technical expertise

Section 6 – Committee Report

Committee reports progress on a semi-annual basis to the SAE Integrated Vehicle Health Management Steering Group and may also report to the SAE Aerospace Standards General Projects Systems Group Chair when required.

ARTICLE II – MEMBERSHIP

Section 1 - Membership

Committee membership consists of individuals who are selected on the basis of need for their particular services and individual qualifications which enable them to contribute to the work of the committee. Membership is open to individuals who represent the industry related to aerospace Structural Health Monitoring as described in article I section 5. The following procedure is for those individuals wishing to become members of the committee:

a. The Chairperson must be notified of an individual’s request for voting membership
b. Two consecutive meetings must be attended for membership qualification of additional members
c. Chairperson notifies new member
d. Chairperson notifies the Aerospace Council of membership records via the annual report
e. If an individual is replacing a current member’s position, item (b) is not required.

Section 2 – Duties of Members

Committee members are expected to actively participate in semiannual committee meetings and contribute to task groups as established. A member not able to attend a semi-annual meeting should select someone to represent him and request the person’s willingness to undertake the duty. The member should notify the Chairperson of this action prior to the meeting. The representative for a member does not need to be an existing member and may have voting rights for the absent member for the meeting.
a. In discharging their responsibilities, committee members function as individuals and not as agents or representatives of any organization with which they may be associated.

b. In voting on technical matters and documents, there will be one vote per member, including EMB members (Article II Section 5). Any voting will be done by members or their designated alternates only. Other guests or visitors, although they may have special knowledge or experience in a particular matter, will not participate in voting. In the event that both the member and the alternate are present, only the member may vote.

c. Committee members are expected to review and respond by SAE ballot to all documents under consideration by the committee. If for whatever reason a member cannot register a Yes or No vote to a document, a “Waive” response is available and should be used to show awareness and recognition of the document and that action has been taken.

Section 3 – Termination of Membership

If a member or their alternate fails to attend, or have a designated representative, at 3 consecutive Committee meetings, their membership on the committee will automatically lapse unless the Chairperson and the EMB determine that other circumstances warrant attention. Other evidence of disinterest within the committee and/or its subcommittees, panels or working groups, will also be considered cause for removing an inactive member at any time. In particular, the neglect by a member to register a vote on committee documents undergoing the SAE ballot process will be cause for a member’s termination. Members dropped from the committee will be transferred to the mailing list and will be informed by the committee Chairperson.

Section 4. – Member Reinstatement

The process for reinstating members who have been terminated is the same as new membership (Article II Section 1). However, a majority vote of the EMB members may immediately reinstate any terminated member due to extenuating circumstances.

Section 5. – Executive Management Board (EMB)

It has been determined by the committee that an EMB must exist in order to preside over critical committee voting matters, not related to technical standard approval. This EMB would be comprised of a small, representative cross-section supporting the views from organizations with the largest vested interest in the success of the SHM industry. This includes end-users, regulators, integrators and the largest weighting for OEM.

a. The scope of the EMB responsibilities include:
   i. The purpose of the EMB is to focus the committee as a whole, steer direction and represent the official position of the committee to the community at large
   ii. All voting matters outside of technical documents would be handled by the EMB, including charter amendment affirmation, Chairperson election, meeting date/locations, creating/terminating documents and working groups.
iii. EMB meetings should be administrative in nature, and there should not be any technical matters discussed outside of the main committee group

iv. If the EMB meetings are held in conjunction general committee meetings (ie same venue and time), they shall be open to any voting committee member for attendance and participation, however only EMB members will be able to vote at these meetings

b. EMB Voting shall be governed as follows:
   i. An EMB ballot can be initiated by any EMB voting member with concurrence of a second EMB voting member that a vote is necessary
   ii. The Chairperson shall be responsible for presiding over all EMB ballots in a timely manner, including composing the official ballot language, distribution of the ballot to all EMB voting members, collecting and tallying votes and notifying the EMB of the ballot results (and committee when appropriate)
   iii. At least 2/3 of the EMB must cast a vote (affirmative, negative or waive) for a ballot to be valid (whether in person, phone, WebEx or email)
   iv. At least 1/2 of the total cast votes must be affirmative for a ballot to pass
   v. All ballots shall remain open for 3-weeks to give EMB member sufficient time to consider their responses and cast their votes, and can only be decided sooner if the remaining outstanding EMB votes would not the affect the ballot results

c. The makeup of EMB voting members shall be as follows:
   i. Current AISC-SHM Chairperson shall preside over the EMB (1 vote)
   ii. OEM: One delegate from any major Aerospace OEM that as a company meets membership standards as defined by Article II. To be clear, the same company employee does not need to attend consecutive meetings, only must ensure continuous representation of the company (3 votes for each OEM)
   iii. Integrators: One delegate from any major Aerospace Integrator that as a company meets membership standards as defined by Article II (1 vote for each)
   iv. Regulators: One delegate from any federal organization that as an agency meets membership standards as defined by Article II (1 vote for each).
   v. Operators: One delegate from any company or federal organization that as an agency meets membership standards as defined by Article II (1 vote for each).

d. EMB voting member term
   i. Delegates from each company or federal agency shall be selected by their respective organizations, however preference should be given to individual members that meet membership standards as defined by Article II.
   ii. There is no maximum or minimum limit to the term for which a delegate can represent their organization on the EMB
   iii. Current delegates must notify the Chairperson whenever there is a change in their Organization’s representing delegation
   iv. If a delegate leaves their organization they will lose their EMB vote unless they qualify under their new organization
   v. If an organization’s membership status lapses, as defined by Article II Section 3, their EMB vote will also be lost until their general voting status is reinstated
   vi. Organizations will only receive a vote under a single category from Section 5c
   vii. No individual can represent more than one organization on the EMB
viii. The Chairperson shall always represent the best interests of the committee rather than their organizational interests, thus for the duration of their term the Chairperson shall have an individual vote separate from their organization.

ix. Any disputes regarding the qualification or categorization of organizations as defined by Section 5c will be settled by EMB majority vote

Section 6. – Non-Voting Participation

Non-voting participants (who have not yet fulfilled the requirements for voting membership according to Article II Section 1) may attend meetings as Liaisons for their organizations as long as they can demonstrate they have expertise in a relevant field related to SHM. Liaisons may attend meetings in person or by phone, may contribute material to standards and may have access to material on SAE StandardWorks. Liaisons will lose this access and will be barred from meetings should the EMB determine their participation is for marketing, business development or other personal gain purposes inconsistent with the scope, objectives and purpose defined in Article I. Individuals within relevant industry or government organizations who are unable to participate in the committee but are interested in its progress may also request Mailing List status.

ARTICLE III – MEETINGS

Section 1 – Timing for Meeting

Committee will meet semiannually, once in the Spring and once in the Autumn/Fall. The first meeting of the calendar year will be typically scheduled in March or April and the second meeting will be typically scheduled in September or October. In both cases, the latitude is available to avoid religious holidays and clashes with other competing professional events. Meeting venues and dates will be determined at least one year ahead and preferably 18 months to allow members to schedule their calendars a year in advance.

Section 2. – Location for Meeting

The location for each meeting will be determined at a regularly scheduled committee meeting. The Chairperson will appoint a location committee at each meeting to solicit nominations at an open forum. They will then conduct a vote to determine the location. There must be a majority of votes cast in favor of the selected location. Recognizing the international importance of SAE, the committee will endeavor to meet at geographically equitable locations. At this time, as the majority of Members participate in the International Workshop on Structural Health Monitoring (IWSHM), every 4th meeting shall be scheduled for the Sunday and Monday preceding that workshop at Stanford University.
Section 3 – Order

In all meetings, the current edition of Robert’s Rules of Order will be followed except as otherwise provided in these bylaws. For purposes of these bylaws, a quorum is defined as attendance of greater than 50% of the eligible voting membership.

ARTICLE IV – OFFICERS

The officers consist of a Chairperson, a Vice Chairperson, and Sub-Chairpersons as necessary for each of the subcommittees, panels and working groups.

Section 1. Chairperson

The Chairperson will be an individual who has demonstrated support for the committee and the field of structural health monitoring.

a. Election: The Chairperson will be elected at an executive board meeting and will receive a majority vote of the EMB members present and voting providing a quorum is present.

b. Term of office: The Chairperson will serve a 2-year term.

c. Duties: The Chairperson will lead the committee in pursuit of its stated goals and objectives. These actions include:

   i. Presiding over all general committee meetings
   ii. Initiating correspondence to the SAE Integrated Vehicle Health Management Steering Group
   iii. Being an ex-officio member of the EMB and all subcommittees, panels and working groups.

Section 2 – Vice Chairperson

The committee Vice Chairperson will be an individual who satisfies the qualifications for chairperson.

a. Election: The Vice Chairperson will be elected at a regular committee meeting and will receive a majority vote of the EMB members present and voting providing a quorum is present.

b. Term of office: The Vice Chairperson will serve a 2-year term. Upon completion of this term it is assumed that this individual will serve as Chairperson for the next 2-year term.

c. Duties: The Vice Chairperson will fulfill in the absence of the Chairperson all the duties incumbent upon that office. In addition the Vice Chairperson will assist the Chairperson in conducting the business of the committee in any way deemed necessary by the Chairperson.
ARTICLE V – DOCUMENTS

The committee will, in accordance with Article I of its charter, issue and maintain documents related to industry experience and state of the art in aerospace SHM.

Section 1 – Roadmap

In order to provide a focus for the AISC-SHM effort and to ensure that all committee members are aware of the overall objective of the committee, a 5 year roadmap may be developed. This plan may be updated and extended on a yearly basis.

Section 2 – Document Content

The documents produced by the committee will address technical and operational issues related to the industry and art of aerospace SHM. They shall not seek to promote any specific product or company. Company or organizational names shall not be used within documents without written approval. Additionally, the committee should familiarize itself with other related or similar published documents by other committees or organizations.

ARTICLE VI – AMENDMENT OF THESE BYLAWS

Amendment of these bylaws will be accomplished by a member submitting a written proposal to the Chairperson. The proposal will be forwarded to the EMB at least 30 days prior to balloting for review and comments. Any comments submitted to the Chairperson by EMB members must be discussed by the EMB prior to a ballot on the amendment. Proposed amendments will require a two thirds approval of the EMB.