Dr. Robert Baron is the President and Chief Consultant of The Aviation Consulting Group. He performs extensive work in his core specializations of Human Factors (HF), Safety Management Systems (SMS), Crew Resource Management (CRM), and Line Operations Safety Audit (LOSA). He consults with, and provides training to, hundreds of aviation organizations on a worldwide basis.

## What's Holding up Your SMS?

The Four Pillars...of course! An SMS (Safety Management System) consists of four major components (also known as the Four Pillars of Safety). These are: a) Safety Policy, b) Safety Risk Management, c) Safety Assurance and Internal Evaluation, and d) Safety Promotion.

*Safety Policy-* Is the structure and outline of how operations are conducted. Among other things, it involves planning, organizing, compliance with regulations and law, documentation, and emergency preparedness and response. It is at this level that upper-level management must buy-in and continuously support the SMS. Without management buy-in and support, the SMS is bound to fail. Employees are highly influenced by management behavior examples and therefore if employees see management intentionally breaking rules or ignoring policy it is likely the employees will emulate this behavior.

*Safety Risk Management-* Safety risk management is the process by which risks are identified, mitigated, or eliminated before they become a visible (surfaced) accident or incident. This is a proactive approach to error prevention and mitigation which is a paradigm shift from the strictly reactive approach that has been used in the past.

Risk can be thought of as the consequence of a hazard and is measured in terms of severity and probability. A Preliminary Hazard Analysis (PHA) can be used to identify the hazards that exist at your aviation organization. Hazard identification can be accomplished by a variety of

methods that include observations, audits, safety surveys, investigations, and research. Other sources include factual briefings from frontline personnel, subject matter experts, brainstorming, and analysis tools such as event trees, fault trees, FMECA's, etc. Once the hazards are identified, they need to be analyzed to see what type of controls may need to be put in place. Risks that have a high severity and high likelihood rating would be the ones that need to be addressed as a priority. On the other hand, risks that have a low severity rating and a low likelihood of occurrence may be classified as acceptable risks that can be lived with.

*Safety Assurance and Internal Evaluation-* The well-known Heinrich Ratio states that, for every fatal accident, there will be three to five nonfatal accidents and 10 to15 incidents; but there will also be *hundreds* of unreported occurrences. Unreported occurrences are extremely problematic since no defenses can be employed if nobody knows these occurrences exist.

One of the most important aspects of Safety Assurance and Internal Evaluation is a hazard reporting system; however, a hazard reporting system may be a challenge to implement due to employees' fear of retribution or punishment. Yet, a good and effective safety culture must include a hazard reporting system. In order to attain this goal you will need to ensure that your organization has a *Just Culture*. A key element of a Just Culture is *trust.* Employees must know that they can report without sanction. Once this trust is established then an organization can have a reporting culture, something that provides the system with an accessible memory, which, in turn, is the essential underpinning to a learning culture (James Reason, 2004). Along the same lines, Gary Eiff (1999) suggests that, "An effective and systematic reporting system is the keystone to identifying the weakness and vulnerability of safety management before an accident occurs. The willingness and ability of an organization to proactively learn and adapt its

operations based on incidents and near misses before an accident occurs is critical to improving safety."

*Safety Promotion-* Includes the development and continuous nurturing of a healthy safety culture, good communication, training, and feedback for lessons learned. The most important aspect of safety promotion is the need have an ongoing, palpable presence to the SMS. This requires open communication between management and employees without fear of retribution, feedback offered on a regular basis, and appropriate employee training on the SMS.