SRM - SA Flowchart Script

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	In any decision making situation, there are a few straightforward (but not always simple!) steps to understanding the problem, assembling necessary information, and making an informed decision. We'll outline five steps and them apply them to the SMS processes of Safety Risk Management and Safety Assurance.
1	In any decision making problem, the first step is to gain a fundamental understanding of the problem domain. In this case, it's to understand the systems and tasks involved in key processes, such as flight operations, maintenance, ground operations, etc.
2	The next step is to get some information about these system elements that will be relevant to our decisions and action.
3	Next we have to analyze the data. This is more than data reduction. Analysis is a human activity that is used to make inferences based on the data – to make sense of it.
4	Assessment applies value judgments to the situation, as understood in terms of available information and the decision maker's past experience. Is the situation acceptable? Are goals and objectives being met?
5	Finally, we take action on our decisions. Sometimes, the action is really in action – to do nothing. This may be the case where the results of our assessment indicate satisfactory design, performance, or other goal attainment.
6	So, in SMS, there are two essential processes – Safety Risk Management (SRM), and Safety Assurance (SA). SRM is the process by which we design and implement risk controls and…
7	… SA is the process by which we "assure"[1] (to gain confidence) that they are working as intended.
8	The first step in SRM it system and task analysis. Here, the analysis need only to be as extensive as needed to understand the processes in enough detail to develop procedures, design appropriate training curricula, to identify hazards, and to measure performance. The level of detail required may vary depending on the complexity and safety criticality of the process involved. Detail beyond this point is not necessary.
9	Next, we look at the processes and play "what if?" What could go wrong with our processes, under typical or abnormal operational conditions that could be considered hazardous?
10	Based on the analysis in the hazard identification step, we determine the injury and damage potential of the events related to the hazards in terms of likelihood of occurrence of the events and severity of resulting consequences.
11	Risk assessment is a decision step based on combined severity and likelihood. Is the risk acceptable? Where potential severity is low or if likelihood is low or well controlled with existing controls, we may be done…
12	…ready for operation.
13	If not, we'll need to design risk controls. Most often, these entail either new processes or equipment, or changes to existing ones.

[1] *Black's Law Dictionary*, a common legal reference, defines "assurance" as "something that gives confidence." Using this definition, "safety assurance" refers to activities and processes that allow FAA and operators to gain confidence that safety objectives are being met.

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14	We then look at the system with the proposed control in place to see if the level of risk is now acceptable. We'll stay in this design loop until it is or until we determine that the proposed operation, change, etc. can't be mitigated to allow operations within acceptable levels of risk.
15	If we're successful, we're done with SRM and ready for operation. It's essential here to note that we need to update any related system documentation to reflect the risk control. Particularly where operation of the system is acceptable only with a particular control in place (e.g. "M" and "O" procedures in an MEL), it will be important to monitor operations to be sure that these continue to be in place, current, and effective. Monitoring and management of these controls will be one of the most important steps in safety assurance.
16	Next, we'll need to collect a variety of data to test the controls. These data range from continuous monitoring (e.g. dispatch procedures), to periodic auditing, to employee reporting systems that fill in the gaps. It also includes investigations to learn from our failures.
17	As in SRM, we will need to analyze the data in terms of performance objectives and to determine root causes of any shortfalls. We'll also be on the lookout for any new conditions that haven't seen before and unexpected results of system performance.
18	Also as in SRM, the assessment process is one in which we'll make decisions. In this case, we will see we're satisfied with the performance and effectiveness of our risk controls. This determination is called "Continuing Operational Safety" (C.O.S.).
19	If the assessment results are satisfactory, we continue in the checking, analyzing, and assessment loop – the "happy loop," where we continuously affirm that we're getting what we want.
20	If we don't get what we want, we'll need to correct the system. This needn't entail the same level of detail that we used in initial design. Many times, the corrective action needed is straightforward.
21	At this point, we go back into operation. We should continue to particularly monitor areas where corrections have been required to be sure that we don't have a repeat situation or a latent condition that we've missed.
22	Sometimes, though, everyone is doing everything that we expected but it just isn't working to control the level of risk (possibly the conditions have changed so that the original control no longer is appropriate). This can be because of changes in contracts, changes to airports, new equipment, changing demographics of employee hiring pools or a variety of new conditions. At any rate, we've identified a new and uncontrolled hazard so we need to return to the SRM process to re-design the system aspects (e.g. new procedures, training, etc.) or develop new controls.
23	Now that we've outlined the SRM and SA processes, we can step back and look at them more broadly. The SRM process is essentially a design process and…
24	The SA process is a performance assurance process. It is used to "assure" (to gain confidence) in the system's ability to maintain Continuing Operational Safety (C.O.S.).