



# DESIGN AND MANUFACTURING SAFETY MANAGEMENT SYSTEM

Tony Randall

2021 EASA Rotorcraft and VTOL Symposium

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# Purpose

- **Inform about D&M SMS**
- Current and upcoming rule making activity
- Acceptable standards
- Bell development and implementation

# Bell D&M SMS FAA Acceptance – Voluntary Implementation Program



U.S. Department of Transportation  
Federal Aviation Administration

March 21, 2018

Mitch Snyder  
President and CEO  
Bell  
3255 Bell Helicopter Blvd.  
Fort Worth, TX 76118

Dear Mr. Mitch Snyder:

This letter is to acknowledge the Federal Aviation Administration (FAA) has reviewed and assessed Bell's Safety Management System (SMS) per the Aircraft Certification Services Voluntary SMS Assessment guide dated 1 June 2017. Although Title 14 Code of Federal Regulations (14 CFR), part 5, Safety Management Systems, does not currently apply to Design and Manufacturing certificate holders, the FAA found this SMS meets the intent of those requirements.

This letter of acceptance applies to the Bell SMS system description dated April 3, 2017.

As part of the recognition, and in order to maintain acceptability of your SMS, all changes and revisions should be submitted as they occur. Changes and revisions should be submitted to Amy Garzaro at [amy.garzaro@faa.gov](mailto:amy.garzaro@faa.gov), as well as your National Team lead. Submitting all changes and revisions will assist in maintaining acceptability of your SMS. Additionally, there will be oversight of the SMS per the FAA's on-going SMS evaluation program planned to be implemented in 2018. We will contact you when additional information and scheduling is available.

Additionally, you may also use the National Aerospace Standard (NAS) 9927, Safety Management System Practices for Design and Manufacturing, to conduct self-assessments of your organization. NAS 9927 has been recognized by the FAA as an acceptable means of SMS implementation for design and manufacturing organizations. This voluntary program is consistent with 14 CFR part 5.

Respectfully,

Michael Reinert  
Manager, Systems Performance and Development Branch  
Policy and Innovation Division  
Aircraft Certification Service

## Bell Succeeds in Reaching World Class Safety Management Standard



Bell becomes the first airframe Original Equipment Manufacturer in the world to achieve acceptance during FAA Voluntary Implementation Program Safety Management System audit... ☺

Pictured (L-R): Tony Randall, Barbara Capron (FAA), Rick York (FAA), Mitch Snyder, Amy Garzaro (FAA), Scott Harris, Frank Smith, Dr. Ingrid Knox (FAA)

### Other Top Stories

Fast and Easy IT Assistance - Live Agent Chat

Celebrating People with Autism in April

New Branded Badges Are Coming!

Bell Succeeds in Reaching World Class Safety Management Standard

Exciting Perks for Bell Employees

How We Make The

## Bell gained acceptance of our D&M SMS from the FAA – March 2018

### Compliance Assessments:

All Bell Fort Worth area facilities (Q1 2018)  
Bell Amarillo (Q4 2018)  
Bell Ozark (Q1 2019)  
Bell India (Q2 2019)  
Bell Piney Flats (Q4 2019)  
Bell Miami (Q1 2021)

Successful Performance Assessments (2019 & 2020)

Bell Canada has gained D&M SMS acceptance from TCCA (Q4 2020)



Mr. Dave Turnbull, Director, National Aircraft Certification  
Mr. Robert Sincennes, Director of Standards  
Transport Canada Civil Aviation  
330 Sparks St.  
Ottawa, Ontario, K1A 0N8

Type Ex: Note release

Our Ex: Note release

822643 - 1703291

(Delivered via E-Mail)

November 23<sup>rd</sup>, 2020

Mr. Steven Lavoie  
President & Accountable Executive  
Bell Textron Canada Ltd.  
12800 Rue de l'Aviation  
Montreal, QC J7J 1H4

RE: Voluntarily Implemented Design and Manufacturing Safety Management System Application

Mr. Steven Lavoie,

A presence and suitability assessment of Bell Textron Canada Ltd. was carried out by Transport Canada Civil Aviation (TCCA) between October 02, 2020 and November 18, 2020 as part of the Voluntary Safety Management System (SMS) Program application process to demonstrate that Bell Textron Canada Ltd. has voluntarily met the intent of SM-0001 - International Industry Standard - Implementing a Safety Management System in Design, Manufacturing and Maintenance Organizations.

TCCA has concluded that Bell Textron Canada Ltd. has completed the requirements of the assessment demonstrating the 'presence and suitability' aspects of the Voluntary SMS program, meeting the intent of the SM-0001.

Furthermore, this letter is to confirm that TCCA recognizes Bell Textron Canada Ltd.'s voluntary compliance with SMS in accordance with the SM-0001 as an Alternate Means of Compliance (AMC) in the case of Aircraft Design and Manufacturing Organizations (and Production Organizations). Given the current global pandemic, a demonstrated compliance assessment to determine that the SMS is both operating and effective will be performed at a later date either virtually and/or on-site, depending on the complexity of the system. Upon successful completion of the demonstrated compliance portion, a final Letter of Acceptance would be issued to show that TCCA has accepted the Voluntary SMS as meeting the intent of SM-0001.

In order to maintain acceptability once the final Letter of Acceptance is issued, all changes and revisions must be submitted as they occur.

Enclosed are copies of the presence and suitability assessment report as a summary of this activity.

We would like to thank you and your staff for the courtesy and co-operation demonstrated during the course of the Voluntary SMS program application process, including the initial launch and implementation. Your assistance in this respect was invaluable to the process.

Sincerely,

Robert Sincennes  
Director  
Standards

David Turnbull  
Director  
National Aircraft Certification

Canada



- Bell participated on the AIA Industry Team that developed NAS 9927 (US Standard)
- Participating on the industry team revising SM-0001 (International Standard)
- Goal is to create a single standard recognized by all aviation authorities as an acceptable means of compliance



# What is SMS?



***Safety Management System: An international initiative to drive a formal, systematic, top-down organizational approach to managing aviation and product safety risk, including all of the necessary organizational structures, accountabilities, policies and procedures.\****

\* Annex 19 to the Convention on International Civil Aviation, Safety Management, contains safety management standards. As a member of ICAO, the United States (U.S.) has committed to comply with ICAO safety management standards.

**When the term safety is used in relation to design and manufacturing organizations, it should be understood as the prevention of human injury and loss of life, as well as avoidance of damage to the environment and property, in the course of activities associated with the aviation industry. These activities include: design, certification, production, quality, continued operational safety, aircraft maintenance, and flight operations.**



A new US law: **H.R.133—1128 Aircraft Certification, Safety, and Accountability Act** was published in early January 2021 that will officially make D&M SMS mandatory in the US:

Section 102 Safety Management Systems

(a) Rulemaking Proceeding. -

(1) In General. - Not later than 30 days after the date of enactment of this title, the Administrator shall initiate a rulemaking proceeding to require that manufacturers that hold both a type certificate and a production certificate issued pursuant to section 44704 of title 49, United States Code, where the United States is the State of Design and State of Manufacture, have in place a safety management system that is consistent with the standards and recommended practices established by ICAO and contained in annex 19 to the Convention on International Civil Aviation (61 Stat. 1180), for such systems.

(2) CONTENTS OF REGULATIONS. - The regulations issued under paragraph (1) shall, at a minimum –

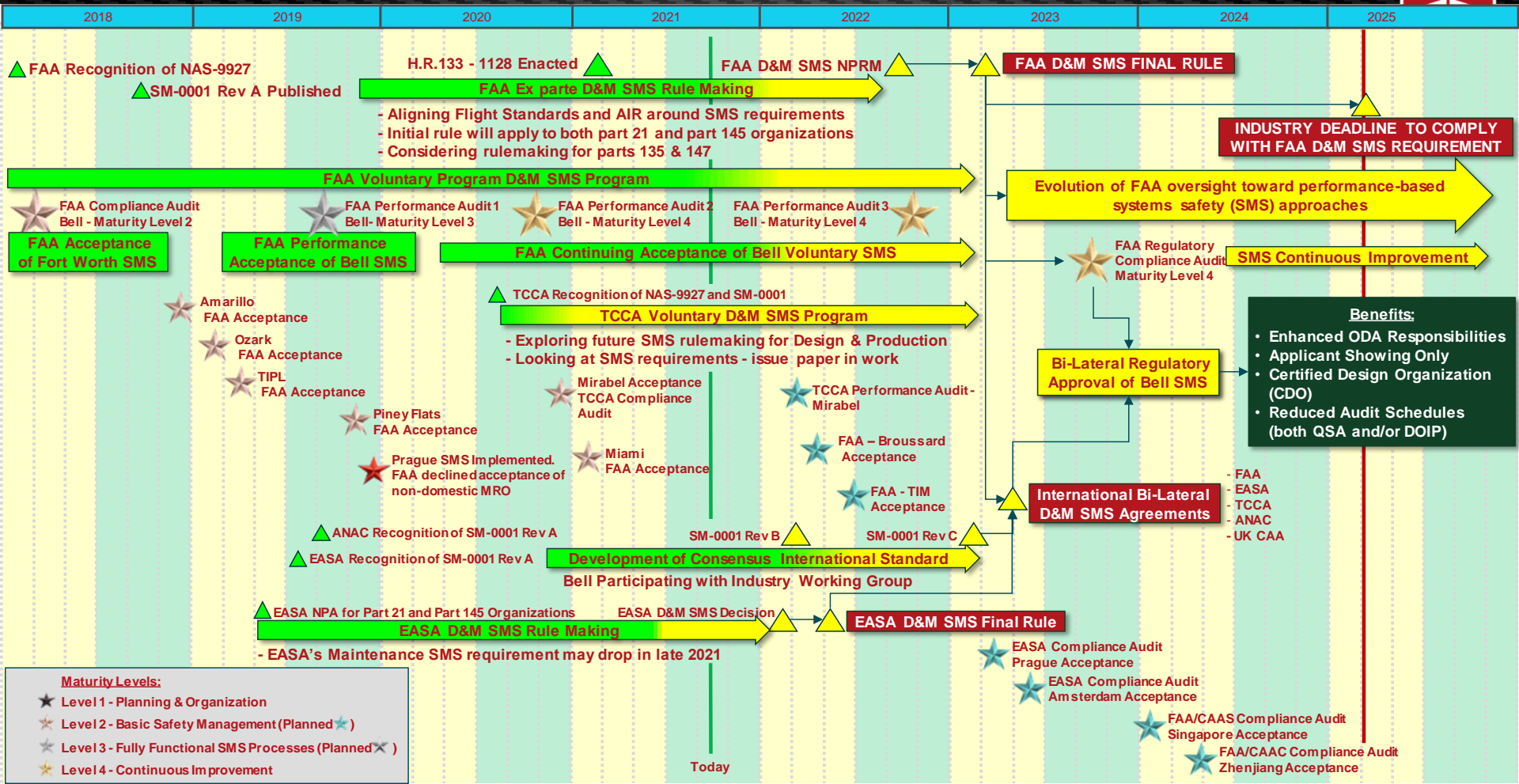
- (A) ensure safety management systems are consistent with, and complementary to, existing safety management systems;
- (B) include provisions that would permit operational feedback from operators and pilots qualified on the manufacturers' equipment to ensure that the operational assumptions made during design and certification remain valid;
- (C) include provisions for the Administrator's approval of, and regular oversight of adherence to, a certificate holder's safety management system adopted pursuant to such regulations; and
- (D) require such certificate holder to adopt, not later than 4 years after the date of enactment of this title, a safety management system.

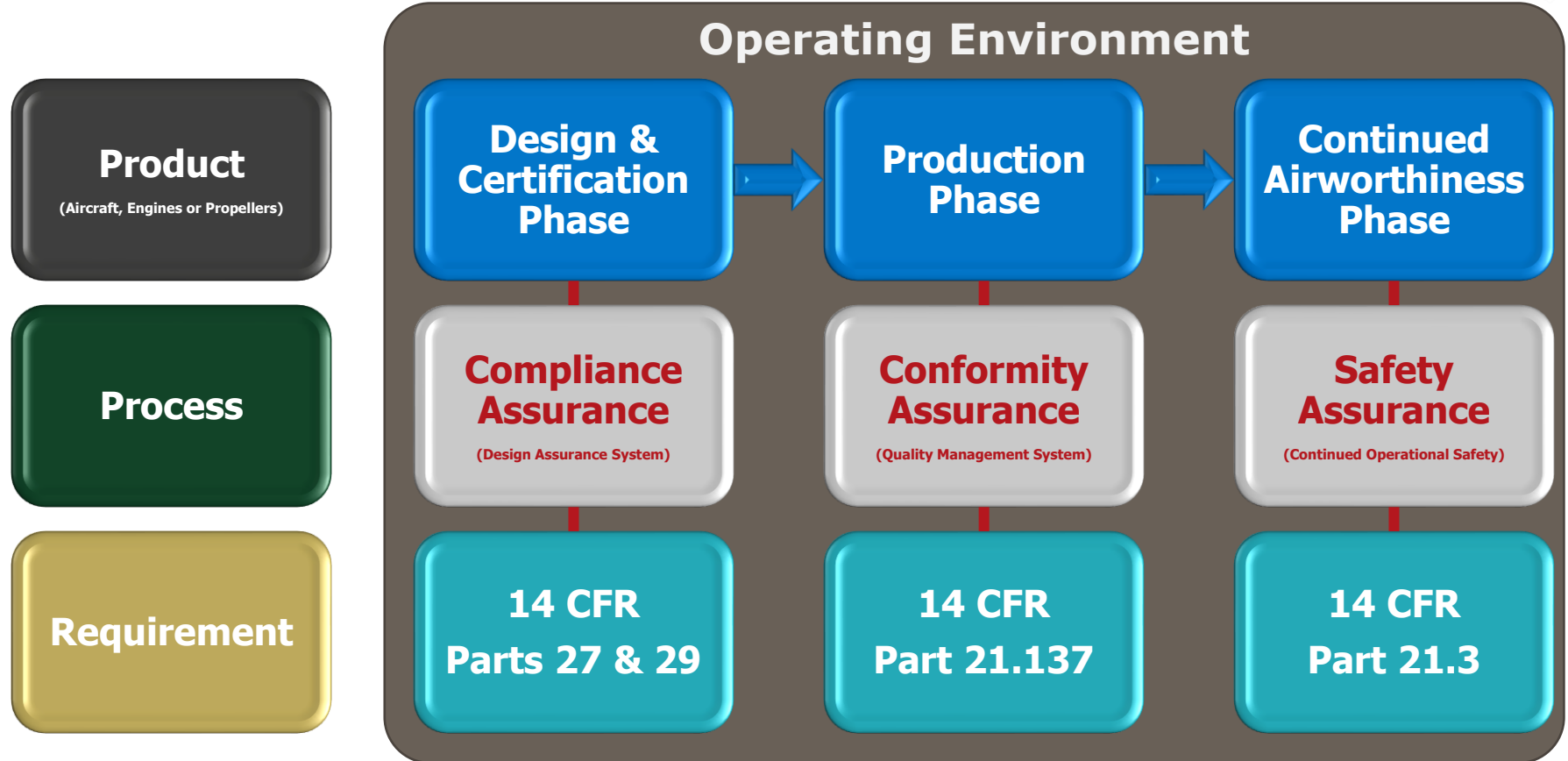
**Rulemaking must be completed by the FAA by February 2023**

**A Certificate Holder's SMS must be in place and approved by the FAA by February 2025**

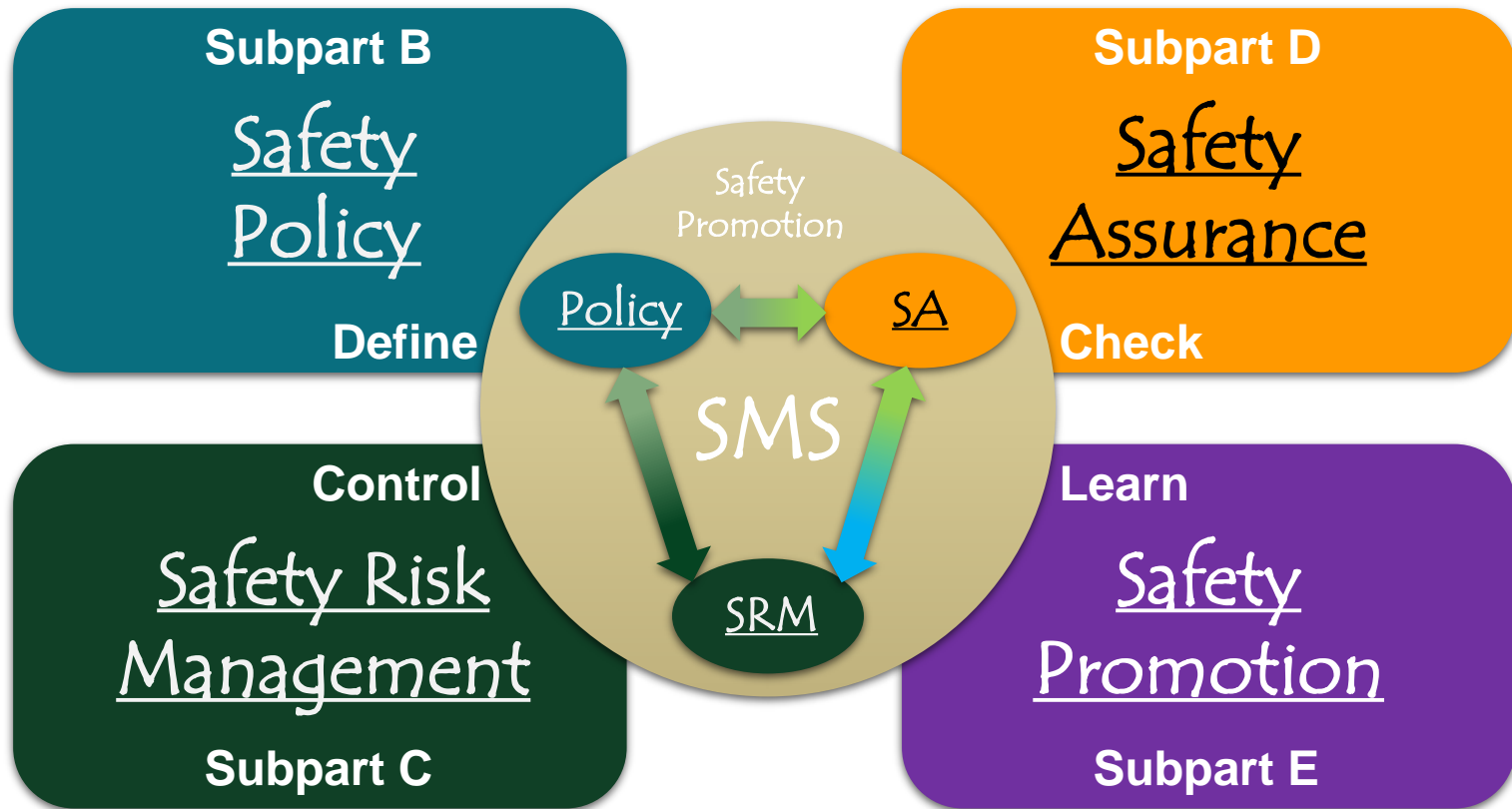


# Bell 5 Year D&M SMS Plan









# Statement of the Accountable Executive



## 14 CFR Part 5 Subpart B

**Safety Policy:** Establishes senior management's commitment to continually improve safety; defines the methods, processes, and organizational structure needed to meet the safety goals.

**Includes:** Processes; Policies; Procedures; Organization, Roles & Responsibilities

**The Statement of the Accountable Executive is contained in the Safety Policy**

**Verbalizes the CEO's commitment to aviation safety**

**Delineates the company's safety objectives**

### II. Statement of the Accountable Executive

Bell's objective is to provide the safest workplace for our employees, and at the same time provide the highest standards of safety, quality and service to our customers. We will constantly strive to improve these standards, thereby maintaining our position as a global leader in the manufacture of vertical lift aircraft and provider of associated services. Outstanding safety performance is critical to the success of our business.

Through our Just Culture, Safety Risk Management, and policy of continuous improvement, we will maximize the inherent safety of our operations by promoting best practices in product and aviation safety to achieve Bell's high-level product/aviation safety objectives:

- Design and manufacture of safe vertical lift air vehicles
- Superior continued operational safety
- Safe internal flight operations
- Proactive employee participation in product/aviation safety and hazard reporting
- Inherent compliance to processes, procedures and policies associated with the design, manufacture and continued operational safety of Bell products
- Comprehensive safety risk management of compliance and conformity assurance processes.

The leadership of Bell commits to providing the necessary resources to ensure implementation of SMS fundamentals, and will:

- Consult, listen, communicate and respond openly to our staff and customers.
- Ensure personnel competence and accountability. Everyone employed at Bell is responsible for ensuring their own wellbeing, as well as exercising a duty of care to others, by operating appropriately and demonstrating compliance with this policy, associated regulatory requirements, and company processes and procedures at all times.
- Actively engage in Safety Risk Management and Safety Assurance activities.
- Openly report all aspects of our safety performance.
- Recognize those who contribute to improve product safety performance.
- Ensure that a Just Culture is maintained at all times.

Company procedures ensure the means to sustain and monitor compliance with US and International Standards, and to ensure that we comply with the safety requirements of the Airworthiness Authorities.

Safety is not the sole responsibility of any single person or department, it involves all employees in the company, and it is the responsibility of all of us to comply with this policy and to strive to improve our safety standards at every opportunity.

This document describes an SMS that complies with current Federal Aviation Administration (FAA) guidelines and regulations. All incorporated documents identified and every amendment thereto meet the requirements established in this document. The policies and procedures outlined in this document and in all incorporated documents identified herein must be strictly adhered to at all times. In case of conflict between FAA regulations and this Policy, the FAA regulations will prevail.

  
Mitch Snyder, President and CEO Bell Textron Inc.

11/24/15  
Date

**Highlights the company's safety responsibilities to our customers**

**Makes a commitment to the Just Culture process**

**Encourages employees to report all hazards and incidents associated with our internal flight operations, products and services**

**Signed by CEO**

## Standard Safety Risk Matrix, Risk Assessment and Risk Acceptance.

Probability	Severity				
	Catastrophic 1	Hazardous 2	Major 3	Minor 4	No Safety Effect 5
	Frequent A				
	Probable B				
	Occasional C				
	Remote D				
Improbable E					

HAZARD PROBABILITY	PROBABILITY LEVEL	QUALITATIVE DEFINITION		QUANTITATIVE PROBABILITY (Per Flight Hour)
		Individual system or subsystem	Fleet or Inventory Occurrence	
Frequent	A	Likely to occur often	Continuously experienced	$>1.0 E^{-3}$
Probable	B	Will occur several times in the life of an item	Will occur frequently	$\leq 1.0 E^{-3}$
Occasional	C	Likely to occur sometime in the life of an item	Likely to occur several times	$\leq 1.0 E^{-5}$
Remote	D	Unlikely but could occur in the life of an item	Unlikely, but can reasonably be expected to occur	$\leq 1.0 E^{-7}$
Improbable	E	So unlikely you can assume it will not occur in the life of an item	Unlikely, but possible to occur	$\leq 1.0 E^{-9}$

### 14 CFR Part 5 Subpart C

#### Safety Risk Management:

Determines the need for, and adequacy of, new or revised risk controls based on the assessment of acceptable risk.

Includes: Risk Assessment & Mitigation; Hazard Identification and Tracking.

HAZARD SEVERITY	SEVERITY LEVEL	FAILURE CONDITION EFFECTS			
		Crew	Occupants (Excluding Flight Crew)	Aircraft	Environment
Catastrophic	1	Fatalities or incapacitation	Fatalities	Loss of Aircraft	Severe (irreversible) damage to the environment or a major violation of environmental law.
Hazardous	2	Serious injury, physical distress or excessive workload impairs ability to perform tasks accurately or completely.	Serious injury to a passenger	Large reductions in functional capabilities or safety margins, and/or major damage to aircraft.	Severe (reversible) damage to the environment or a minor violation of environmental law.
Major	3	Minor injury, physical discomfort or a significant increase in workload or in conditions impairing crew efficiency.	Physical distress, possibly including minor injuries.	Significant reduction in functional capabilities or safety margin, and/or damage to individual aircraft systems.	Major (mitigable) damage to the environment and is a not a violation of environmental law.
Minor	4	Slight increase in work load which involve crew actions well within crew capabilities, such as routine flight plan changes.	Physical discomfort	Slight reduction in functional capabilities or safety margins, and/or damage to individual components.	Minimal damage to the environment and is a not a violation of environmental law.
No Safety Effect	5	No effect on flight crew	Inconvenience	No effect on operational capabilities or safety.	No environmental impact

Risk Level	Action Required		Management Authority Level
	Reactive (Event Has Occurred)	Predictive (Event Could Occur)	
High	Ground fleet and investigate immediately. Root Cause / Corrective Action required.	Unacceptable for day-to-day operations. Operation must not begin, or continue, without appropriate levels of management awareness and approval of risk mitigation plan(s) occurs.	CEO must review and approve risk mitigation plan(s), and accept residual risk. Note: Acceptable by CEO for UAV.
Serious	Investigate immediately. Root Cause / Corrective Action required.	Acceptable only with approval of risk mitigation plan(s).	Program VP/Program Director must review and approve risk mitigation plan(s), and accept residual risk.
Medium	Investigate and conduct additional risk assessment. Root Cause / Corrective Action required.	Acceptable only with mitigation & monitoring to ALARP.	Program Chief Engineer must review and approve risk mitigation plan(s), and accept residual risk.
Low	Monitor and conduct additional risk assessment as required.	Acceptable with existing risk controls, without further mitigation. Use for continuous improvement/ lessons learned.	Chief Engineer accepts the risk assessment and risk level determination.

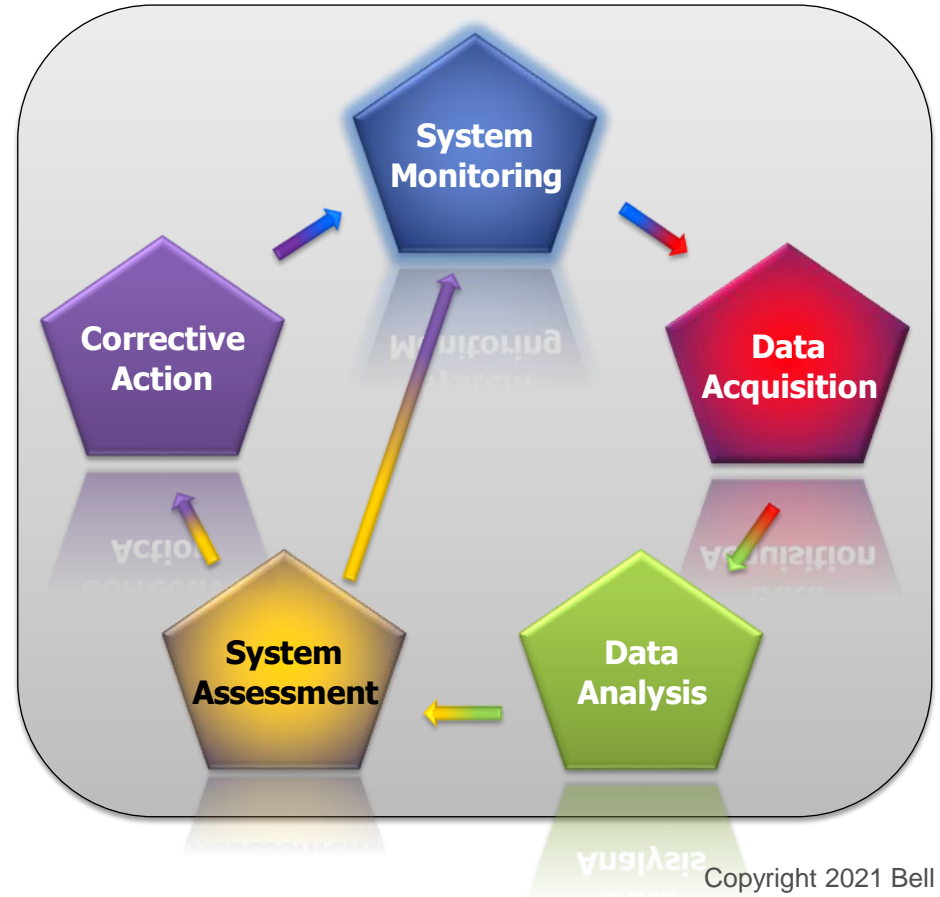
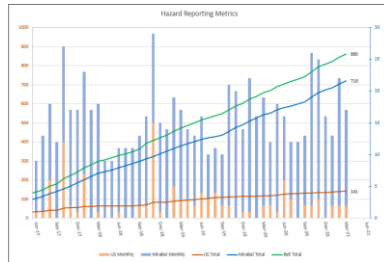
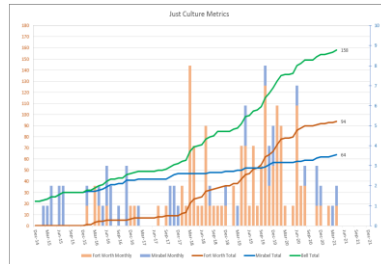
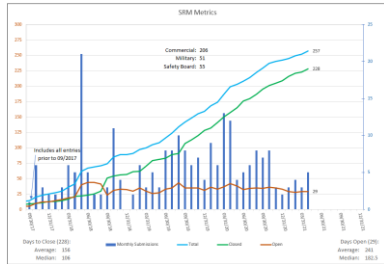
# Safety Assurance



## 14 CRF Part 5 Subpart D

**Safety Assurance:** Evaluates the continued effectiveness of implemented risk control strategies and supports the identification of new hazards.

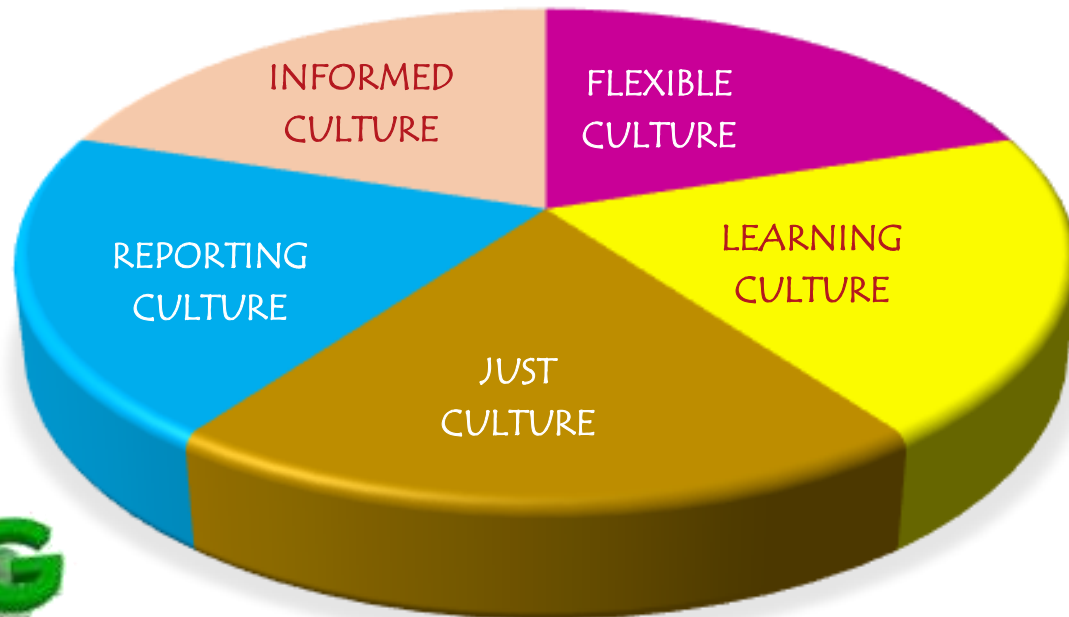
**Includes:** Internal Evaluation, Internal Audits, Corrective Actions.



## 14 CFR Part 5 Subpart E

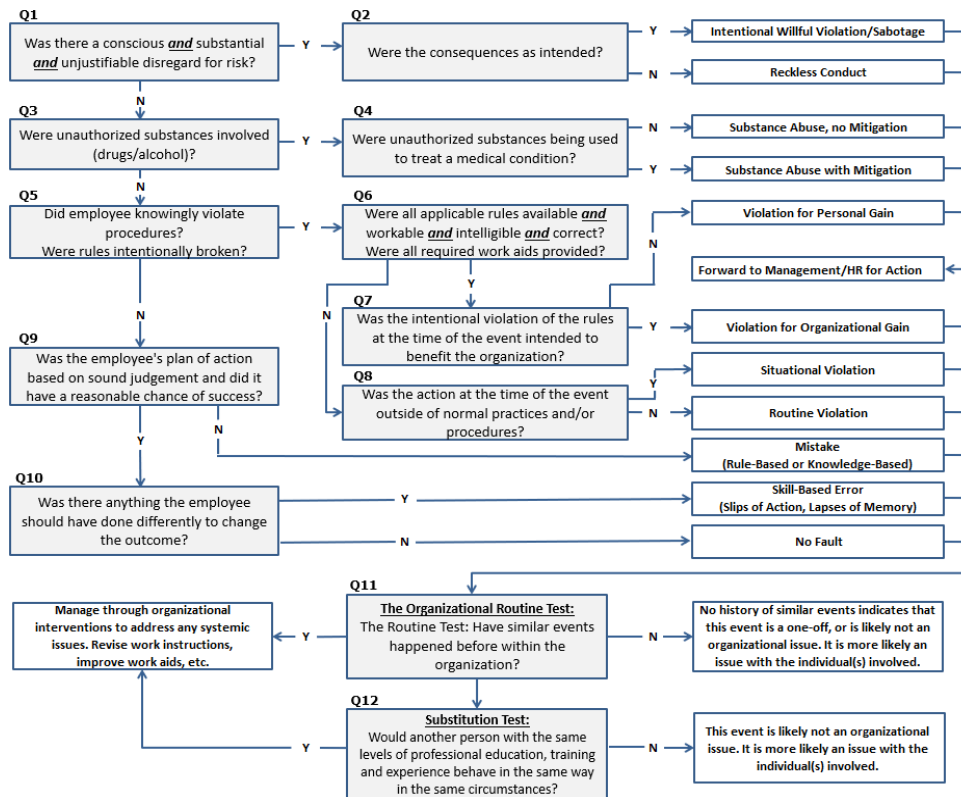
Safety Promotion: Training, communication, and other actions to create a positive safety culture within all levels of the workforce.

Includes: Safety Culture; Just Culture, Confidential Safety Reporting.



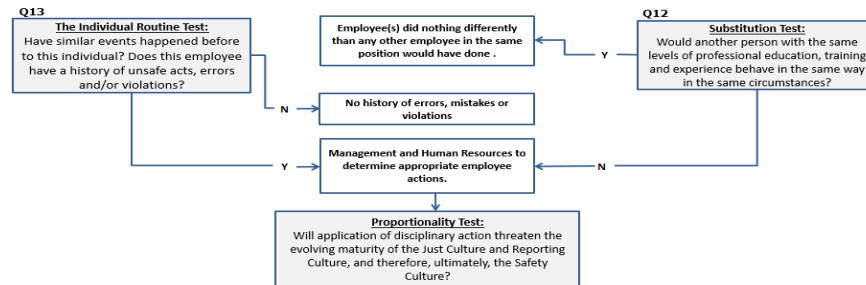
**SAFETY CULTURE: THE HEART OF AN SMS**

## Behavioral Determination



## Employee vs. Organizational Contribution

Management and Human Resources must now separate reasonable actions from unreasonable actions. The Substitution Test, Routine Test, and Proportionality Test are applied to help determine how the issue will be mitigated.





# Bell SMS Process Overview

