SYSTEM COMPONENT FAILURE—NON-POWERPLANT (SCF−NP)

DEFINITIONS AND USAGE NOTES

August 2012 (1.0)

The System Component Failure−Non-Powerplant Taxonomy is a sub-categorization the CICTT SCF−NP Occurrence Category. It enables categorization and coding of system failure occurrence types.

RECORD OF REVISIONS

Date	Version	Section	Revision
8/2012	1.0		Document Creation

TABLE OF CONTENTS

AVIONICS SYSTEMS (AVION) 2
CABIN SYSTEMS (CABIN) 2
ELECTRICAL POWER SYSTEMS (ELEC) 3
ENVIRONMENTAL CONTROL SYSTEMS (ECS) 3
FLIGHT CONTROL SYSTEMS (FC) 3
AUTOMATIC FLIGHT CONTROLS (AUTOPILOT, AUTOTHROTTLE, AUTOTHRUST) (AFC) 3
FUEL SYSTEMS (FUEL) 4
LANDING GEAR (LG) 4
MISCELLANEOUS SYSTEMS (MISC) 4
ROTOR SYSTEMS (RS) 4
STRUCTURES (STRUCT) 5
APPENDIX A CODE ABBREVIATIONS 47
APPENDIX B AVIATION ACRONYMS 52

TABLE OF TERMS

AVIONICS SYSTEMS (AVION) 8

ALTITUDE INFORMATION LOSS (SCF−NP−AVION−ALTLS) 8

ALTITUDE INFORMATION ERROR (SCF−NP−AVION−ALTERR) 8

AIRSPEED INFORMATION LOSS (SCF−NP−AVION−ASLS) 8

AIRSPEED INFORMATION ERROR (SCF−NP−AVION−ASERR) 9

ATTITUDE INFORMATION LOSS (SCF−NP−AVION−ATTLS) 9

ATTITUDE INFORMATION ERROR (SCF−NP−AVION−ATTERR) 9

ANGLE OF ATTACK INFORMATION LOSS (SCF−NP−AVION−AOALS) 9

ANGLE OF ATTACK INFORMATION ERROR (SCF−NP−AVION−AOAERR) 9

HEADING INFORMATION LOSS (SCF−NP−AVION−HDGLS) 10

HEADING INFORMATION ERROR (SCF−NP−AVION−HDGERR) 10

NAVIGATION INFORMATION LOSS (SCF−NP−AVION−NAVLS) 10

NAVIGATION INFORMATION ERROR (SCF−NP−AVION−NAVERR) 10

WARNING LOSS (SCF−NP−AVION−WRNLS) 11

WARNING ERROR (SCF−NP−AVION−WRNERR) 12

COMMUNICATION WITH AIR TRAFFIC CONTROL LOSS (SCF−NP−AVION−COMMLS) 12

COMMAND AND CONTROL LINK TO UNMANNED AIRCRAFT SYSTEM LOSS (SCF−NP−AVION−LINKLS) 13

PRECISION APPROACH INFORMATION ERROR (SCF−NP−AVION−GSLOCERR) 13

FLIGHT MANAGEMENT INFORMATION ERROR (SCF−NP−AVION−FMIERR) 13

INTEGRATED DISPLAY UNIT LOSS (SCF−NP−AVION−DULS) 13

OTHER AVIONICS FAILURE OR MALFUNCTION (SCF−NP−AVION−OTHR) 14

CABIN SYSTEMS (CABIN) 15

PILOT OXYGEN FAILURE (SCF−NP−CABIN−O2PILFL) 15

UNCOMMANDED MOVEMENT OF PILOT SEAT (SCF−NP−CABIN−SEATMVUNC) 15

AIRCRAFT SEAT FAILURE (SCF−NP−CABIN−SEATFL) 15

PERSONNEL RESTRAINT SYSTEM FAILURE (SCF−NP−CABIN−RESTFL) 16

EMERGENCY EXIT FAILURE (SCF−NP−CABIN−EXITFL) 16

UNCOMMANDED DOOR OPERATION (SCF−NP−CABIN−DROPUNC) 16

EMERGENCY LIGHTING FAILURE (SCF−NP−CABIN−ELITFL) 16

CABIN ATTENDANT PANELS FAILURE (SCF−NP−CABIN−CAPFL) 16

GALLEY SYSTEM FAILURE (SCF−NP−CABIN−GAFL) 17

OTHER CABIN SYSTEMS MALFUNCTION OR FAILURE (SCF−NP−CABIN−OTHR) 17
ELECTRICAL POWER SYSTEMS (ELEC) 18
ELECTRICAL GENERATING CAPABILITY LOSS (SCF−NP−ELEC−GENLS) 18
ELECTRICAL SYSTEM MALFUNCTION (SCF−NP−ELEC−SYSMALF) 18
WIRE DAMAGE (SCF−NP−ELEC−WIREDMG) 19
ARCING (SCF−NP−ELEC−ARC) 19
OTHER ELECTRICAL FAILURE OR MALFUNCTION (SCF−NP−ELEC−OTHR) 19
ENVIRONMENTAL CONTROL SYSTEMS (ECS) 20
CABIN DECOMPRESSION (SCF−NP−ECS−DECOMP) 20
CABIN OVERPRESSURIZATION (SCF−NP−ECS−PROVER) 20
CABIN PRESSURIZATION FAILURE (SCF−NP−ECS−PRFL) 20
INTERIOR TEMPERATURE CONTROL LOSS (SCF−NP−ECS−TEMPCTRLFL) 21
INABILITY TO CLEAR SMOKE FROM FLIGHT DECK (SCF−NP−ECS−SMKPERSIS) 21
NEGATIVE PRESSURE RELIEF VALVE FAILURE (SCF−NP−ECS−NGRLFL) 21
OTHER ENVIRONMENTAL CONTROL SYSTEM MALFUNCTION OR FAILURE (SCF−NP−ECS−OTHR) 21
FLIGHT CONTROL SYSTEMS (FC) 22
UNCOMMANDED FLIGHT CONTROL MOVEMENT (SCF−NP−FC−UNCMV) 22
FLIGHT CONTROL SURFACE FAILURE TO MOVE AS COMMANDED (SCF−NP−FC−MVFL) 22
SIGNIFICANT CHANGES IN CONTROL FORCE (SCF−NP−FC−FRCCHG) 23
FLY-BY-WIRE REVERSION (SCF−NP−FC−FBWREV) 23
OTHER FLIGHT CONTROL SYSTEMS MALFUNCTION OR FAILURE (SCF−NP−FC−OTHR) 23
AUTOMATIC FLIGHT CONTROLS (AUTOPILOT, AUTOTHROTTLE, AUTOTHRUST) (AFC) 24
AUTOPILOT FUNCTION LOSS (SCF−NP−AFC−APLS) 24
AUTOPILOT CONTROL OR GUIDANCE ERROR (SCF−NP−AFC−APERR) 24
AUTOPILOT MODE CHANGE ANNUNCIATION FAILURE (SCF−NP−AFC−APMCFL) 25
AUTOMATIC THRUST CONTROL UNAVAILABLE OR LOSS (SCF−NP−AFC−ATLS) 25
AUTOMATIC THRUST CONTROL ERROR (SCF−NP−AFC−ATERR) 25
AUTOMATIC PROTECTION FUNCTIONS FAILURE (SCF−NP−AFC−AUTOPROTFL) 25
AUTOMATIC BRAKING LOSS (SCF−NP−AFC−ABRKLS) 25
AUTOMATIC BRAKING OPERATION ERROR (SCF−NP−AFC−ABRKERR) 26
UNMANNED AIRCRAFT FOLLOWING AUTONOMOUS OPERATION PROGRAM FAILURE (SCF−NP−AFC−AOPFL) 26
OTHER AUTOMATIC FLIGHT CONTROLS MALFUNCTION OR FAILURE (SCF−NP−AFC−OTHR) 26

FUEL SYSTEMS (FUEL) 27
FUEL TANK PRESSURE (SCF−NP−FUEL−TNKPR) 27
FUEL IMBALANCE (SCF−NP−FUEL−IMB) 27
FUEL CONTROL (SCF−NP−FUEL−CTRL) 28
FUEL LEAK (SCF−NP−FUEL−LK) 28
FUEL JETTISON FAILURE (SCF−NP−FUEL−JETTFL) 28
CONTAMINATED FUEL (SCF−NP−FUEL−CONTAM) 29
OTHER FUEL SYSTEMS MALFUNCTION OR FAILURE (SCF−NP−FUEL−OTHR) 29
LANDING GEAR (LG) 30
LANDING GEAR EXTEND FAILURE (SCF−NP−LG−EXTFL) 30
LANDING GEAR RETRACT FAILURE (SCF−NP−LG−RETFL) 30
LANDING GEAR STRUCTURAL FAILURE (SCF−NP−LG−STRUCTFL) 31
INDICATION FAILURE (SCF−NP−LG−INDFL) 31
STEERING SYSTEM FAILURE (SCF−NP−LG−STEERFL) 31
TIRE FAILURE (SCF−NP−LG−TIREFL) 32
WHEEL FAILURE (SCF−NP−LG−WHLFL) 32
BRAKE SYSTEM FAILURE (SCF−NP−LG−BRKFL) 33
LANDING GEAR VIBRATION (SCF−NP−LG−VIB) 33
FLOTATION SYSTEM FAILURE (SCF−NP−LG−FLOTFL) 33
OTHER LANDING GEAR MALFUNCTION OR FAILURE (SCF−NP−LG−OTHR) 34
MISCELLANEOUS SYSTEMS (MISC) 35
AUXILIARY POWER UNIT FAILURE (SCF−NP−MISC−APUFL) 35
PNEUMATIC SYSTEM FAILURE (SCF−NP−MISC−PNEUFL) 36
HYDRAULIC SYSTEM FAILURE (SCF−NP−MISC−HYDFL) 36
CARGO RESTRAINT SYSTEM FAILURE (SCF−NP−MISC−CARGRSTFL) 36
ANTI-ICE OR DE-ICE FUNCTION FAILURE (SCF−NP−MISC−ANTICEFL) 37
FIRE EXTINGUISHING SYSTEM FAILURE (SCF−NP−MISC−FIREEXTFL) 37
EQUIPMENT COOLING LOSS (SCF−NP−MISC−COOLLS) 37
WIRE STRIKE PROTECTION SYSTEM FAILURE (SCF−NP−MISC−WSPSFL) 37
OTHER MISCELLANEOUS MALFUNCTION OR FAILURE (SCF−NP−MISC−OTHR) 38
ROTOR SYSTEMS (RS) 39
MAIN ROTOR DRIVE SYSTEM FAILURE (SCF−NP−RS−MRDSFL) 39
MAIN ROTOR CONTROL SYSTEM FAILURE (SCF−NP−RS−MRCSFL) 39

MAIN ROTOR BLADE FAILURE (SCF−NP−RS−MRBFL) 40
MAIN ROTOR HEAD FAILURE (SCF−NP−RS−MRHDFL) 40
TAIL ROTOR DRIVE SYSTEM FAILURE (SCF−NP−RS−TRDSFL) 40
TAIL ROTOR CONTROL SYSTEM FAILURE (SCF−NP−RS−TRCSFL) 41
NOTAR SYSTEM FAILURE (SCF−NP−RS−NOTARFL) 41
TAIL ROTOR BLADE FAILURE (SCF−NP−RS−TRBFL) 41
TAIL ROTOR HEAD FAILURE (SCF−NP−RS−TRHDFL) 42
OTHER ROTOR SYSTEM MALFUNCTION OR FAILURE (SCF−NP−RS−OTHR) 42
STRUCTURES (STRUCT) 43
SEPARATION OF LARGE ITEMS FROM AIRCRAFT (SCF−NP−STRUCT−PDA) 43
SEPARATION OF CONTROL SURFACES (SCF−NP−STRUCT−CTRLSFC) 43
CONTROL SURFACE VIBRATION (SCF−NP−STRUCT−CTRLSFCVIB) 43
BREACH OF PRESSURIZED FUSELAGE SKIN (SCF−NP−STRUCT−PRFSBR) 44
CABIN DECOMPRESSION (SCF−NP−STRUCT−DECOMP) 44
CRACKS IN AIRCRAFT STRUCTURE (SCF−NP−STRUCT−CRK) 44
CORROSION (SCF−NP−STRUCT−CORR) 45
CABIN WINDOW PROBLEMS (SCF−NP−STRUCT−CABINWDW) 45
FLIGHT DECK WINDOW PROBLEMS (SCF−NP−STRUCT−FLTDKWDW) 45
COMPOSITE DELAMINATION (SCF−NP−STRUCT−DELAM) 45
COMPOSITE HONEYCOMB CORE FAILURE (SCF−NP−STRUCT−HCFL) 46
OTHER STRUCTURES MALFUNCTION OR FAILURE (SCF−NP−STRUCT−OTHR) 46

INTRODUCTION

The International Civil Aviation Organization (ICAO) and the Commercial Aviation Safety Team (CAST), which includes Government officials and aviation industry leaders, have jointly chartered the CAST/ICAO Common Taxonomy Team (CICTT). The team was charged with developing common taxonomies and definitions for aviation accident and incident reporting systems. The common taxonomies and definitions are intended to improve the aviation community's capacity to focus on common safety issues. CICTT includes experts from air carriers, aircraft manufacturers, engine manufacturers, pilot associations, regulatory authorities, transportation safety boards, and ICAO, and members from Canada, the European Union, France, Italy, Japan, the Netherlands, the United Kingdom, and the United States. CICTT is co-chaired by a representative from ICAO and a representative from CAST.

To accomplish its objectives, CICTT has developed common taxonomies including an Occurrence Category taxonomy. The taxonomy defined in this document, System Component Failure−Non Powerplant (SCF−NP), is a subcategory within the Occurrence Category taxonomy.

It is important to note that CICTT does not expect governments, international organizations, and corporations to immediately change existing data systems or existing definitions. The intent is to provide "target" taxonomies and definitions for adoption by organizations planning for, and implementing new safety systems.

The SCF−NP taxonomy is intended to be used with transport category airplanes, small airplanes (both powered and gliders), rotorcraft, and Unmanned Aircraft Systems (UAS).

The SCF−NP taxonomy scheme typically follows the format SCF−NP−XXX−YYY where XXX is three or more letters indicating the aircraft "system" and YYY is three or more letters designating the particular failure or malfunction of that system. In the case of UAS an optional suffix, −RPS, can be added by the coder when the failure occurs on a Remote Pilot Station (RPS) yielding a format SCF−NP−XXX−YYY−RPS. The optional suffix should not be added if the failure occurs on an unmanned aircraft itself; in that case the typical format SCF−NP−XXX−YYY is appropriate.

An important element of the design of the SCF−NP taxonomy is that it supports the association of multiple categories with a single event. For example, if there was Equipment Cooling Loss (SCF−NP−MISC−COOLLS) *and* a Flight Management Information Error (SCF−NP−AVION−FMIERR), the event would be coded in both categories. Additionally, an event can be coded in multiple occurrence category taxonomies. If an airspeed information error leads to a Loss of Control-Inflight (LOC-I), which is a CICTT Occurrence Taxonomy term, the following codes would apply: SCF−NP−AVION−ASERR and LOC−I.

This taxonomy is organized into 11 groups:

- Avionics Systems.

- Cabin Systems.
- Electrical Power Systems.
- Environmental Control Systems.
- Flight Control Systems.
- Automatic Flight Controls.
- Fuel Systems.
- Landing Gear.
- Miscellaneous Systems.
- Rotor Systems.
- Structures.

The purpose of this grouping is primarily to be a classification scheme that provides an intuitive coding and easy lookup of taxonomy codes. These groups are not intended to adhere to a strict engineering definition of individual aircraft systems. Those are too numerous to be useful as an SCF−NP classification scheme.

The SCF−NP taxonomy is focused on capturing what happened: what failed or malfunctioned. The SCF−NP taxonomy groups and codes were generated to convey the loss or degradation of function. For example, SCF−NP applies Airspeed Information Error (SCF−NP−AVION−ASERR) irrespective of what sub-system caused the error. The cause may not be known at the time of event coding. Furthermore, the degradation of a function, e.g., Navigation Information Error (SCF−NP−AVION−NAVERR), may be due to erroneous data loaded into the navigation system or later data corruption. It should be coded as SCF−NP−AVION−NAVERR because the data is part of the system.

It is sometimes difficult to determine if a failure occurred within the design envelop of the aircraft or not. If a failure occurs, code it irrespective of whether it occurred within the design limits. For example, code the Separation of Large Items from Aircraft as SCF−NP−STRUCT−PDA regardless of the aircraft's speed when the item separated. Again, SCF−NP coding is focused on what happened, not why it happened. The "why" may be determined from later investigation.

The codes included in this document are applicable to an occurrence even if they occur temporarily. For instance, if the landing gear fails to extend fully on an initial attempt but extends in subsequent attempts, the code SCF−NP−LG−EXTFL is still appropriate.

Occurrences of fire, smoke, and burning fumes events are not included in this document. This is because those events are to be coded in the appropriate CICTT Occurrence Categories such as FIRE/SMOKE (NON−IMPACT) (F−NI) or FIRE/SMOKE (POST−IMPACT) (F−POST). If however a system component failure or malfunction such as a fuel leak (SCF−NP−FUEL−LK) or arcing event (SCF−NP−ELEC−ARC) was involved in the causal chain, then multi-coding of appropriate codes from within this document is encouraged.

Contact for all CICTT work:

CICTT@intlaviationstandards.org

AVIONICS SYSTEMS (AVION)

Includes:

- Displays.
- Air data such as altimetry, airspeed, or temperature sensing.
- Angle of Attack sensing.
- Aircraft attitude and heading sensing.
- Navigation function including position sensing, flight management, etc.
- Warning systems.
- Communication systems.
- Radar Systems.
- Emergency Location Transmitters.

Excludes:

- Do not code Autopilots, Flight Directors, automatic thrust control systems, etc. under AVION, instead code under the Automatic Flight Control (AFC).

ALTITUDE INFORMATION LOSS (SCF−NP−AVION−ALTLS)

Loss of altitude information.

Usage notes:

- Includes blanking or flagging of barometric altitude or radio height information.
- Includes loss of primary or standby altitude or radio height.

ALTITUDE INFORMATION ERROR (SCF−NP−AVION−ALTERR)

Erroneous altitude or height information.

Usage notes:

- Includes erroneous information on any display.
- Includes errors in barometric altitude or radio height information.
- Includes erroneous primary or standby altitude or radio height.
- Includes frozen indications.

AIRSPEED INFORMATION LOSS (SCF−NP−AVION−ASLS)

Loss of airspeed information.

Usage notes:

- Includes blanking or flagging of airspeed or Mach number information.
- Includes loss of primary or standby airspeed or Mach number.

AIRSPEED INFORMATION ERROR (SCF−NP−AVION−ASERR)

Erroneous airspeed information.

Usage notes:

- Includes erroneous information on any display.
- Includes errors in any airspeed or Mach number information, whether primary or standby.
- Includes frozen indications.

ATTITUDE INFORMATION LOSS (SCF−NP−AVION−ATTLS)

Loss of attitude information.

Usage notes:

- Attitude, in this case, is defined as roll or pitch attitude.
- Includes blanking or flagging of attitude information.
- Includes loss of primary or standby attitude.

ATTITUDE INFORMATION ERROR (SCF−NP−AVION−ATTERR)

Erroneous attitude information.

Usage notes:

- Attitude, in this case, is defined as roll or pitch attitude.
- Includes erroneous information on any display.
- Includes erroneous primary or standby attitude information.
- Includes frozen indications.

ANGLE OF ATTACK INFORMATION LOSS (SCF−NP−AVION−AOALS)

Loss of Angle of attack information.

Usage notes:

- Includes any loss of angle of attack indication.
- Includes blanking or flagging of angle of attack.

ANGLE OF ATTACK INFORMATION ERROR (SCF−NP−AVION−AOAERR)

Erroneous Angle of attack information.

Usage notes:

- Includes erroneous or frozen indications.

HEADING INFORMATION LOSS (SCF−NP−AVION−HDGLS)

Loss of heading information.

Usage notes:

- Blanking or flagging of heading information.
- Includes loss of primary or standby heading.

HEADING INFORMATION ERROR (SCF−NP−AVION−HDGERR)

Erroneous heading information.

Usage notes:

- Includes erroneous information on any display.
- Includes erroneous primary or standby heading information.

NAVIGATION INFORMATION LOSS (SCF−NP−AVION−NAVLS)

Loss of navigation information to the flight crew.

Usage notes:

- Includes loss of any navigation information due to onboard system failures.
- Includes blanking or flagging of navigation information due to onboard system failures.
- Excludes loss of information due to unavailability of ground or spaced-based signals.
- Examples of included systems: automatic direction finder (ADF), very high frequency omnidirectional range (VOR), distance measuring equipment (DME), Global Positioning System (GPS), long-range navigation (LORAN), Automatic Dependent Surveillance−Broadcast (ADS−B), inertial systems, or weather radar.

NAVIGATION INFORMATION ERROR (SCF−NP−AVION−NAVERR)

Erroneous navigation information to the flight crew.

Usage notes:

- Includes erroneous information on any display.
- Includes erroneous navigational information due to onboard system failures.
- Includes erroneous navigational information due to errors in navigation databases.
- Includes failures to flag erroneous navigation indications due to erroneous ground or space-based signals.
- Examples of included systems: ADF, VOR, DME, GPS, LORAN, inertial systems or weather radar.

Loss of warning function.

Usage notes:

- Includes any failure of warnings regardless of cause.
- Excludes loss of caution level alerts since caution level alerts do not require immediate flight crew action.
- Warning definition: an automatic function that alerts the flight crew to situations that require immediate awareness and crew action to maintain flight safety.
- Warnings include any sensory path such as visual, tactile, aural, etc.
- Examples of warnings include:
  - Low Rotor RPM warning.
  - Traffic warning.
  - Windshear warning.
  - Engine-related warnings.
  - Fire or smoke warnings.
  - Pneumatic bleed failure warnings.
  - Terrain warnings.
  - Airspeed Overspeed warning.
  - Cabin Altitude warning.
  - Stall warning.
  - Takeoff Configuration.
  - Hydraulic System warnings.
  - Icing warnings.

WARNING ERROR (SCF−NP−AVION−WRNERR)

Erroneous warning.

Usage notes:

- Includes any erroneous warnings regardless of cause.
- Excludes erroneous caution level alerts since caution level alerts do not require immediate flight crew action.
- Warning definition: An automatic function that alerts the flight crew to situations that require immediate awareness and crew action to maintain flight safety.
- Warnings include any sensory path such as visual, tactile, aural, etc.
- Examples of warnings include:
  - Low Rotor RPM warning.
  - Traffic warning.
  - Windshear warning.
  - Engine-related warnings.
  - Terrain warnings.
  - Airspeed Overspeed warning.
  - Stall warning.
  - Takeoff Configuration warning.
  - Fire or Smoke warnings.
  - Pneumatic bleed failure warnings.
  - Hydraulic system warnings.
  - Icing warnings.

COMMUNICATION WITH AIR TRAFFIC CONTROL LOSS (SCF−NP−AVION−COMMLS)

Loss of the ability to transmit and/or receive communications with Air Traffic Control (ATC) due to onboard equipment failure.

Usage notes:

- Includes loss of transmit and/or receive on all radios.
- Includes microphone stuck in transmit mode.
- Includes transponder failures.
- Includes communication loss between an RPS and ATC.
- Excludes loss due to excessive range from station.
- Excludes ATC Communications Losses due to ground-based ATC equipment failures.
- If the only communication remaining is the transponder, this would still be coded as SCF−NP−AVION−COMMLS.

COMMAND AND CONTROL LINK TO UNMANNED AIRCRAFT SYSTEM LOSS (SCF−NP−AVION−LINKLS)

Unanticipated lost command and control link to a UAS.

Usage notes:

- To be coded regardless of where the failure occurred, i.e., on the unmanned aircraft, in the remote pilot station (coded with a –RPS suffix), or in the communication infrastructure between them, whether the communication infrastructure is ground, air or space based, or a combination.
- Excludes lost links that are anticipated. For instance, loss of link due to anticipated temporary line-of-sight limitations are excluded.

PRECISION APPROACH INFORMATION ERROR (SCF−NP−AVION−GSLOCERR)

Erroneous or misleading precision instrument approach information.

Usage notes:

To be coded regardless of cause of the erroneous or misleading information.

FLIGHT MANAGEMENT INFORMATION ERROR (SCF−NP−AVION−FMIERR)

Flight management information errors that are safety-related.

Usage notes:

- Includes failure to communicate to the displays.
- Includes outdated or erroneous databases.
- Examples of safety-critical flight management information: Large V-speed errors, fuel management information, runway needed information, weight and balance information, map shift.

INTEGRATED DISPLAY UNIT LOSS (SCF−NP−AVION−DULS)

Loss of one or more integrated display units.

Usage notes:

- If specific information is still available on other display units, then only this code would be applied. For example, if altitude information is lost on a blanked display unit but is displayable on another display unit, then Altitude Information loss (SCF−NP−AVION−ALTLS) would not be coded.

OTHER AVIONICS FAILURE OR MALFUNCTION (SCF−NP−AVION−OTHR)

Any other safety-related failure or malfunction of the avionics system.

Usage notes:

- Includes failures of the emergency locator transmitter.

CABIN SYSTEMS (CABIN)

Cabin Systems include all convenience and emergency items for the passengers and crew such as:

- Doors.
- Emergency Exits.
- Passenger entertainment equipment.
- Seats.
- Emergency Equipment, e.g., fire extinguishers, floatation devices, medical equipment.
- Personal fire protection equipment.
- Galleys.
- Lavatories.
- Cabin lighting systems including emergency lighting systems.
- Personnel Restraint Systems, e.g., seat belts, etc.
- Oxygen Systems.
- Overhead Stowage Bins.
- Potable and waste water systems.
- Other Cabin Equipment and Furnishings.

PILOT OXYGEN FAILURE (SCF−NP−CABIN−O2PILFL)

Failure or malfunction of the flight crew supplemental oxygen system or protective breathing equipment.

Usage notes:

- None at this time.

UNCOMMANDED MOVEMENT OF PILOT SEAT (SCF−NP−CABIN−SEATMVUNC)

Uncommanded movement of a flight crew seat.

Usage notes:

- Includes vertical, horizontal, or lateral movement.

AIRCRAFT SEAT FAILURE (SCF−NP−CABIN−SEATFL)

Failure of a flight crew, cabin crew or passenger seat to support the occupant as intended.

Usage notes:

- Includes failure of seat rails or similar structure to support seat.

PERSONNEL RESTRAINT SYSTEM FAILURE (SCF−NP−CABIN−RESTFL)

Failure of flight crew, cabin crew or passenger restraint systems.

Usage notes:

- Includes:
  - Passenger seat belt system.
  - Crew seat belts and harnesses.
  - Air Bag Systems.

EMERGENCY EXIT FAILURE (SCF−NP−CABIN−EXITFL)

Failure of the emergency exits to open, close, or operate properly.

Usage notes:

- Includes failure to function of crew ejection and escape systems on aircraft so equipped.
- Includes failures of emergency escape slides to deploy.

UNCOMMANDED DOOR OPERATION (SCF−NP−CABIN−DROPUNC)

Uncommanded or inadvertent operation of passenger doors, cargo doors, or emergency exits.

Usage notes:

- Includes inadvertent deployment of emergency escape slides.

EMERGENCY LIGHTING FAILURE (SCF−NP−CABIN−ELITFL)

Failure of the cabin emergency marking or lighting system.

Usage notes:

- None at this time.

CABIN ATTENDANT PANELS FAILURE (SCF−NP−CABIN−CAPFL)

Any safety-significant failure of a cabin attendant panel.

Usage notes:

- Examples: Uncommanded lighting or communication system failure.
- Electrical shorts and arcing code as SCF−NP−CABIN−CAPFL and as Arcing (SCF−NP−ELEC−ARC).

GALLEY SYSTEM FAILURE (SCF−NP−CABIN−GAFL)

Failures of galley systems that are safety-significant.

Usage notes:

- Includes overheating caused by a Galley system failure.
- Includes failure to contain liquids with other systems affected.
- Includes runaway galley carts.
- Electrical shorts and arcing code as SCF−NP−CABIN−GAFL and as Arcing (SCF−NP−ELEC−ARC).

OTHER CABIN SYSTEMS MALFUNCTION OR FAILURE (SCF−NP−CABIN−OTHR)

Other safety-related cabin system failure.

Usage notes:

- None at this time.

ELECTRICAL POWER SYSTEMS (ELEC)

Electrical Systems include all electrical power generation, transmission and control subsystems:

- Generators and Alternators
- Voltage and current regulation devices.
- Circuit protection devices.
- Wiring and Connectors
- Switches and other electrical systems control.
- Standby devices such as batteries.

ELECTRICAL GENERATING CAPABILITY LOSS (SCF−NP−ELEC−GENLS)

Loss of the aircraft's electrical generating capability.

Usage notes:

- Includes losses affecting only part of a redundant system, e.g., loss of one out of two generators.
- Includes loss of standby electrical generating capability.
- Includes losses of the Ram Air Turbine (RAT) electrical generating capability.

ELECTRICAL SYSTEM MALFUNCTION (SCF−NP−ELEC−SYSMALF)

Electrical system malfunction.

Usage notes:

- Includes transients, out of tolerance voltage or frequency, "dirty power", etc.
- Includes loss of DC to AC and AC to DC conversion function.
- Includes malfunctions affecting only part of a redundant system, e.g., malfunction of one out of two generators.
- Includes malfunctions of load shedding function.
- Includes circuit overloads that cause a circuit protection devices to trip.
- Includes malfunctions of circuit protection devices such as circuit breakers.
- Do not code electrical arcing or sparking as SCF−NP−ELEC−SYSMALF, instead code as Arcing (SCF−NP−ELEC−ARC).
- Do not code loss of electrical generating capability as SCF−NP−ELEC−SYSMALF, instead code as Electrical Generating Capability Loss (SCF−NP−ELEC−GENLS).

WIRE DAMAGE (SCF−NP−ELEC−WIREDMG)

Chafing, nicks, cuts, fraying, insulation degradation or other damage to wires, wire bundles, power feeder cables or connectors.

Usage notes:

- Includes damage to wires, wire bundles, or power feeder cables anywhere in the airplane.
- Includes damage to wires, wire bundles or power feeder cables in the vicinity of fuel system components.
- Includes damage to wires, wire bundles or power feeder cables in the vicinity of oxygen system components.

ARCING (SCF−NP−ELEC−ARC)

Short circuits, arcing or sparking of wires, wire bundles or power feeder cables.

Usage notes:

- Includes arcing of wires, wire bundles, or power feeder cables anywhere in the airplane.
- Includes arcing of wires, wire bundles, or power feeder cables in the vicinity of fuel system components.
- Includes arcing of wires, wire bundles, or power feeder cables in the vicinity of oxygen system components.

OTHER ELECTRICAL FAILURE OR MALFUNCTION (SCF−NP−ELEC−OTHR)

Any other safety-significant failure or malfunction of the electrical system.

Usage notes:

- Loss of electrical system cooling should be coded as Equipment Cooling Loss (SCF−NP−MISC−COOLLS).

ENVIRONMENTAL CONTROL SYSTEMS (ECS)

Environmental Control Systems include all systems that maintain an environment to sustain life and comfort in flight such as:

- Air Conditioning systems.
- Pressure controls and pressure controlling devices.
- Pneumatic Pressure Valves.
- Door and window seals.

CABIN DECOMPRESSION (SCF−NP−ECS−DECOMP)

Cabin Decompression due to failure of the Environmental Control System.

Usage notes:

- Includes explosive, rapid, or slow decompression due to failure of an ECS.
- Do not code decompression associated with structural failures as SCF−NP−ECS−DECOMP, instead code as Cabin Decompression (SCF−NP−STRUCT−DECOMP).
- Examples:
  - Uncommanded movement of a pneumatic valve.
  - Pressurization controller failure.
  - Cabin seal failure (Doors/Windows).

CABIN OVERPRESSURIZATION (SCF−NP−ECS−PROVER)

Cabin Overpressurization due to failure of the Environmental Control System.

Usage notes:

- Includes the inability to depressurize the cabin when on ground.
- Includes extreme over pressurization in flight.

CABIN PRESSURIZATION FAILURE (SCF−NP−ECS−PRFL)

Failure to pressurize due to failure of the Environmental Control System.

Usage notes:

- Examples:
  - Inappropriate movement of a pneumatic valve.
  - Pressurization controller failure.
  - Cabin seal failure (Doors/Windows).
  - Air data static port or air data sensing failure.
  - Failure of pneumatic lines or ducting.

INTERIOR TEMPERATURE CONTROL LOSS (SCF−NP−ECS−TEMPCTRLFL)

Loss of the crew's ability to control interior temperature or airflow in the aircraft.

Usage notes:

- Includes low or high temperatures.
- Examples include:
  - Inability to control flight deck or cabin temperature due to temperature sensor failure.
  - Failure of temperature control panel.
  - Failure of Air Distribution ducting or valves.
  - Failure of heat exchanging equipment.
  - Failure of an Air Cycle Machine.

INABILITY TO CLEAR SMOKE FROM FLIGHT DECK (SCF−NP−ECS−SMKPERSIS)

Inability to clear smoke from the flight deck.

Usage notes:

- None at this time.

NEGATIVE PRESSURE RELIEF VALVE FAILURE (SCF−NP−ECS−NGRLFL)

Failure of the cabin negative pressure relief valve.

Usage notes:

- Includes opening at inappropriate pressure differentials.
- Includes failure to open when needed, typically resulting in a lower pressure inside the cabin than outside the cabin.

OTHER ENVIRONMENTAL CONTROL SYSTEM MALFUNCTION OR FAILURE (SCF−NP−ECS−OTHR)

Any other safety-relevant failure or malfunction of the Environmental Control System.

Usage notes:

- Example: Uncontainment of rotating equipment such as air cycle machines or ECS fans.

FLIGHT CONTROL SYSTEMS (FC)

Includes control systems exclusive of propulsion systems that allow flight crew control of attitude, heading, angle of attack, and sideslip angle such as:

- Pitch control via elevators or horizontal stabilizer.
- Sideslip control via rudder.
- Roll rate control via ailerons or differential spoilers.

Does not include:

- Automatic flight controls as specified in the Automatic Flight Control System (AFC) section of this document.

UNCOMMANDED FLIGHT CONTROL MOVEMENT (SCF−NP−FC−UNCMV)

Movement of any flight control surface that is not commanded by a pilot or automatic flight controls.

Usage notes:

- Includes primary flight controls and secondary flight control surfaces such as lift and drag devices and tabs.
- Includes trim runaways.
- Do not code separation of control surfaces under SCF−NP−FC−UNCMV, instead code under Structures (STRUCT).
- Do not code movement associated with a malfunctioning automatic flight control under SCF−NP−FC−UNCMV, instead, probably code under Autopilot Control or Guidance Error (SCF−NP−AFC−APERR).

FLIGHT CONTROL SURFACE FAILURE TO MOVE AS COMMANDED (SCF−NP−FC−MVFL)

Failure of any Flight Control Surface to move as commanded by a pilot or automatic flight controls.

Usage notes:

- Includes primary flight controls and secondary flight control surfaces such as lift and drag devices, and tabs.
- Includes failure to move as commanded due to loss of power, mechanical interference, etc.
- Includes inability to trim.
- Includes jams.
- Do not code movement associated with a malfunctioning automatic flight control under SCF−NP−FC−MVFL, instead, probably code under Autopilot Control or Guidance Error (SCF−NP−AFC−APERR).

SIGNIFICANT CHANGES IN CONTROL FORCE (SCF−NP−FC−FRCCHG)

Significant change in control force characteristics.

Usage notes:

- Appropriate for instances in which flight controls can still be moved, but with associated control forces increased or decreased from normal.
- Includes failures of load feel systems.
- Excludes events coded Flight Control Surface to Move as Commanded Failure (SCF−NP−FC−MVFL).
- Excludes events coded Fly-by-wire Reversion (SCF−NP−FC−FBWREV).

FLY-BY-WIRE REVERSION (SCF−NP−FC−FBWREV)

Any reversion of a fly-by-wire or fly-by-light flight control system from the normal mode to an alternate or back-up mode.

Usage notes:

- A Reversionary mode is a degraded flight control mode.

NOTE:

- Manufacturers have many names for degraded flight control modes such as “direct”, “alternate mode(s)”, etc.

OTHER FLIGHT CONTROL SYSTEMS MALFUNCTION OR FAILURE (SCF−NP−FC−OTHR)

Any other safety-significant failure or malfunction of the flight control system.

AUTOMATIC FLIGHT CONTROLS (AUTOPILOT, AUTOTHROTTLE, AUTOTHRUST) (AFC)

Includes:

- Mode management, control, and guidance (any mode in flight or on ground).
- Autothrottle functions wherein the throttles move or autothrust function wherein thrust automatically changes without throttle movement.
- Flight Director.
- Protection functions such as auto pull-up, flight envelope protection, and any auto-terrain avoidance or unsecure area avoidance functions.
- Data control and display associated with automatic flight controls.
- Alerting functions associated with automatic flight control can be found in the AVION section of this document.
- Manual disconnect.
- Autonomous operation of a UAS.
- Automatic braking function such as autobrake or Brake to Vacate.

AUTOPILOT FUNCTION LOSS (SCF−NP−AFC−APLS)

Loss or unavailability of autopilot function.

Usage notes:

- Includes total or partial loss of a guidance mode, loss of mode engagement, failure to capture, and uncommanded autopilot disengagement.
- Includes loss of flight director guidance.

AUTOPILOT CONTROL OR GUIDANCE ERROR (SCF−NP−AFC−APERR)

Erroneous control or guidance by the autopilot.

Usage notes:

- Includes autopilot hard over, slow over, oscillatory failure, or other types of erroneous operation.
- Includes erroneous flight director guidance.

AUTOPILOT MODE CHANGE ANNUNCIATION FAILURE (SCF−NP−AFC−APMCFL)

Unannunciated autopilot mode changes.

Usage notes:

- Includes unannunciated mode change
- Includes unannunciated autopilot disconnect.
- Includes uncommanded mode changes including uncommanded engagement.
- Any unavailability of the autopilot such as total or partial loss of an autopilot mode (failure to engage) should be coded as Autopilot Function Loss (SCF−NP−AFC−APLS).

AUTOMATIC THRUST CONTROL UNAVAILABLE OR LOSS (SCF−NP−AFC−ATLS)

Loss or unavailability of autothrottle or autothrust.

Usage notes:

- Includes loss of autothrottle or autothrust function.

AUTOMATIC THRUST CONTROL ERROR (SCF−NP−AFC−ATERR)

Erroneous autothrottle or autothrust operation.

Usage notes:

- Includes over-thrust or under-thrust due to auto-throttle or autothrust.
- Includes degraded performance of automatic thrust control.
- Includes inappropriate uncommanded autothrottle or autothrust engagement or disengagement.

AUTOMATIC PROTECTION FUNCTIONS FAILURE (SCF−NP−AFC−AUTOPROTFL)

Any loss or erroneous operation of automatic protection functions.

Usage notes:

- Includes protection functions such as automatic collision avoidance, flight envelope protection such as bank angle or stall protection and any automatic terrain avoidance or restricted or prohibited airspace avoidance functions.
- Does not include loss of associated caution or warning. That should be coded as Warning Loss (SCF−NP−AVION−WRNLS).

AUTOMATIC BRAKING LOSS (SCF−NP−AFC−ABRKLS)

Loss of any automatic braking function.

- Includes Autobrake, Brake to Vacate, etc.

AUTOMATIC BRAKING OPERATION ERROR (SCF−NP−AFC−ABRKERR)

Any erroneous automatic braking function.

Usage notes:

- Includes in inappropriate uncommanded automatic braking engagement or disengagement.

UNMANNED AIRCRAFT FOLLOWING AUTONOMOUS OPERATION PROGRAM FAILURE (SCF−NP−AFC−AOPFL)

Failure of an Unmanned Aircraft (UA) to fly autonomous operation program it was intended to fly.

Usage notes:

- To be coded for UAs that are designed to, but fail to, autonomously fly a predetermined path following the loss of the command and control link.

OTHER AUTOMATIC FLIGHT CONTROLS MALFUNCTION OR FAILURE (SCF−NP−AFC−OTHR)

Usage notes:

- Includes things such as:
  - Loss of the ability to manually disconnect the autopilot.
  - Any other safety-related failure or malfunction of the automatic flight control system.

FUEL SYSTEMS (FUEL)

Aircraft Fuel Systems include:

- Fuel Tanks.
- Fuel Lines and associated fittings and valves.
- Fuel quantity indication system.
- Fuel control systems exclusive of engine fuel controls.
- Fuel jettison systems.
- Fuel pumps.
- Fuel filling and servicing systems.

FUEL TANK PRESSURE (SCF−NP−FUEL−TNKPR)

Fuel tank differential pressure not within limits due to a malfunction of the fuel system.

Usage notes:

- Includes failure to properly pressurize tanks.
- Includes over pressurization of tanks.
- Includes failure to properly vent the tanks.
- Excludes tank explosion due to combustion.

FUEL IMBALANCE (SCF−NP−FUEL−IMB)

Due to a system malfunction, fuel quantities in the fuel tanks differ in such a way that the allowable lateral or longitudinal center of gravity limits are exceeded.

Usage notes:

- Includes fuel loads that result in exceedences of certified longitudinal or lateral limits.

FUEL CONTROL (SCF−NP−FUEL−CTRL)

System failure causing inability to properly control the fuel flow or state

Usage notes:

- Failure of the fuel transfer system to transfer fuel as commanded.
- Failure of the fuel transfer system to stop transferring fuel as commanded.
- Fuel starvation caused by a system malfunction causes an engine failure.
- Includes fuel starvation due to a failed filter bypass in conjunction with a clogged filter.
- System transfers fuel when not commanded.
- System does not correctly transfer fuel as commanded.
- Includes failure to feed from the commanded tank.
- If lack of fuel control leads to an imbalance code under SCF−NP−FUEL−CTRL and Fuel Imbalance (SCF−NP−FUEL−IMB).

FUEL LEAK (SCF−NP−FUEL−LK)

Leaks of fuel that could credibly lead to a fire or significant loss of fuel.

Usage notes:

- Includes penetrations of fuel tank regardless of the subsequent loss of fuel.
- Do not code fuel leaks at engine under SCF−NP−FUEL−LK, instead code under Powerplant failure or malfunction taxonomy Flammable Fluid Leak (SCF−PP−FFL).
- Includes leaks directly caused by landing gear separation.
- Seeps are excluded.
- Small leaks that are collected and drained directly overboard by a dedicated drain are excluded.

FUEL JETTISON FAILURE (SCF−NP−FUEL−JETTFL)

Failure of a fuel jettison system to function as commanded.

Usage notes:

- Failure of the system to jettison fuel as commanded.
- Failure of the system to stop jettisoning fuel as commanded.
- System jettisons fuel when not commanded.

CONTAMINATED FUEL (SCF−NP−FUEL−CONTAM)

Any foreign substance in the fuel system which could credibly cause a system failure or malfunction.

Usage notes:

- Can include contaminants introduced from outside the aircraft (i.e. during fueling or servicing).
- Can include contaminants introduced internal to the aircraft as a result of component wear of failure (e.g., fuel filter breakdown or fuel pump failure).
- Does not have to be solid particles (e.g., fueling of an aircraft with incompatible fuel).
- Can include water or ice.

OTHER FUEL SYSTEMS MALFUNCTION OR FAILURE (SCF−NP−FUEL−OTHR)

Any other safety-significant failure or malfunction of the fuel system.

Usage notes:

- None at this time.

LANDING GEAR (LG)

Please note that the various types of landing gear systems are listed in the International Standard for Aircraft Make, Model, and Series Groupings Business Rules, Section 3.19 (Landing Gear), which can be found on the CICTT Website for review.

Landing Gear Systems include:

- Landing Gear Structure.
- Landing Gear Extension and Retraction Mechanisms.
- The aircraft portion of ground towing systems.
- Wheels.
- Tires.
- Brakes.
- Skids.
- Inflatable Emergency Floats.
- Skis.
- Floats.
- Exclusion: Flying boat hulls are not considered part of the landing gear. They are considered to be aircraft fuselage structure.

LANDING GEAR EXTEND FAILURE (SCF-NP-LG-EXTFL)

Failure of the landing gear to extend when commanded.

Usage notes:

- Includes failure of one or more landing gear(s) to fully extend and lock.
- Includes failure of either normal or emergency extension system.
- Includes failures to open landing gear door(s) preventing landing gear extension.
- Includes failures of the landing gear lever or emergency extension lever/command that result in landing gear not being extended.
- This coding is to be used even if the landing gear successfully extends on subsequent attempts.

LANDING GEAR RETRACT FAILURE (SCF-NP-LG-RETFL)

Failure of the landing gear to retract when commanded.

Usage notes:

- Includes failure of one or more landing gear(s) to fully retract and lock.
- Includes failures to open landing gear door(s) preventing landing gear retraction.
- Includes failures of the landing gear lever that result in landing gear not being retracted.
- This coding is to be used even if the landing gear successfully retracts on subsequent attempts.

LANDING GEAR STRUCTURAL FAILURE (SCF−NP−LG−STRUCTFL)

Loss or collapse of primary or secondary landing gear structure such as legs or links.

Usage notes:

- Includes structural failures caused by a deflated or failed shock absorber.
- Includes structural failures to helicopter skids.
- Landing gear separation should be dually coded using both Landing Gear Structural Failure (SCF−NP−LG−STRUCTFL) and Separation of Large Items From Aircraft (SCF−NP−STRUCT−PDA).

INDICATION FAILURE (SCF−NP−LG−INDFL)

Failure of landing gear indicating systems limited to malfunctioning of the indication system only.

Usage notes:

- Includes things such as erroneous or missing:
  - Indication of landing gear up/down and locked.
  - Indication of weight-on-wheels.
  - Indication of landing gear in transit.
  - Brake failure indication.
  - Brake temperature indication.
  - Indication of parking or emergency brake.
  - Tire pressure indications.

STEERING SYSTEM FAILURE (SCF−NP−LG−STEERFL)

Failure of the steering system.

Usage notes:

- Includes steering being inoperative or compromised to an extent that safety is affected.
- Includes uncommanded steering.
- Includes less-than or more-than commanded steering.
- Includes failures of the swivel lock mechanism to lock or unlock.

TIRE FAILURE (SCF−NP−LG−TIREFL)

Tire failures.

Usage notes:

- Includes tire blowouts.
- Includes tread separation.
- Includes tire to wheel separation.
- Includes tire failures resulting collateral damage to critical systems or structure.
- Includes tire failures that occur any time during aircraft operation.
- Do not code tire blowout as a result of brake lock under SCF−NP−LG−TIREFL, instead possibly code under Brake System Failure (SCF−NP−LG−BRKFL) if appropriate.
- Do not code tire blowout as a result of wheel lock under SCF−NP−LG−TIREFL, instead coded under Wheel Failure (SCF−NP−LG−WHLFL).
- Excludes failures when not operating.

WHEEL FAILURE (SCF−NP−LG−WHLFL)

Wheel failures.

Usage notes:

- Includes fractures, loss of one or more wheel, bearing failures, wheel lock.
- Do not code wheel lock as a result of a brake lock under SCF−NP−LG−WHLFL, instead code under Brake System Failure (SCF−NP−LG−BRKFL).

BRAKE SYSTEM FAILURE (SCF−NP−LG−BRKFL)

Brake system failure or malfunction.

Usage notes:

- Includes full or partial loss of primary and/or emergency braking.
- Includes full or partial loss of the parking brake function.
- Includes failure of auto brakes.
- Includes failure of anti-skid system.
- Includes uncommanded braking.
- Includes brake dragging or lock up.
- Brake failures as a result of a hydraulic failure should be coded SCF−NP−LG−BRKFL and Hydraulic System Failure (SCF−NP−MISC−HYDFL).
- Do not code brake indication failure and parking brake indication failure under SCF−NP−LG−BRKFL, instead code under Indication Failure (SCF−NP−LG−INDFL).
- Parking brake indication failure should be coded under Indication Failure (SCF−NP−LG−INDFL)
- Failures of the Automatic Braking function are addressed the Automatic Flight Control (AFC) section of this document.

LANDING GEAR VIBRATION (SCF−NP−LG−VIB)

Landing gear vibration or shimmy.

Usage notes:

- Includes vibration or shimmy on nose, main or tail-mounted landing gear.

FLOTATION SYSTEM FAILURE (SCF−NP−LG−FLOTFL)

Failure or malfunction of normal or emergency flotation system.

Usage notes:

- Includes failure of fixed floats or pontoons.
- Includes failure of inflatable/emergency aircraft flotation systems.
- Do not code failure of flying boat hulls under SCF−NP−LG−FLOTFL, instead code as Cracks in Aircraft Structure (SCF−NP−STRUCT−CRK).

OTHER LANDING GEAR MALFUNCTION OR FAILURE (SCF−NP−LG−OTHR)

Any other safety-related failure or malfunction of the landing gear system.

Usage notes:

- Includes failures of the aircraft portions of ground towing systems.
- Included uncommanded extension or retraction of the landing gear.
- Includes in-flight uncommanded landing gear doors opening
- Includes gear extensions or retractions that are slowed to an extent that the flight crew executes non-normal procedures.

MISCELLANEOUS SYSTEMS (MISC)

These Systems include systems and functions such as:

- Auxiliary Power Unit (APU).
- Anti-Ice and de-ice functions such as De-ice boots, Thermal Anti-Ice, De-Icing fluid systems, etc.
- Windscreen Rain Protection system.
- Fire Extinguishing Systems, including engine/APU and cargo compartments.
- Ballast Systems system.
- Hydraulic Power Systems.
- Pneumatic systems including:
  - Bleed air systems upstream of pressure reducing valves.
  - Pneumatic systems supporting flight instruments.
  - Other types of compressed gas such as landing gear blow down system or evacuation system.
  - Etc.
- Agriculural Application Systems
- Helicopter external hoist system failure.
- Door failures should be coded Uncommanded Door Operation (SCF−NP−CABIN−DROPUNC).
- Wire Strike Protection Systems (WSPS).
- Airborne Towing Systems, Agriculural Application Systems, Ballast Systems, and Windscreen Rain Protection system failures should be coded Other Miscellaneous Malfunction or Failure (SCF−NP−MISC−OTHR).

AUXILIARY POWER UNIT FAILURE (SCF−NP−MISC−APUFL)

Any safety-related failure of an APU system.

Usage notes:

- Includes things such as fire, un-containment of bursting rotating parts, over-speed, case burn through, compartment overheat, flammable fluid leak, fume injection, etc.

PNEUMATIC SYSTEM FAILURE (SCF−NP−MISC−PNEUFL)

Pneumatic system failures such as ruptures or leaks.

Usage notes:

- Includes high pressure systems from the engine bleed ports to the pressure regulating and/or shutoff valve.
- Do not code loss of the pneumatic system warning systems under SCF−NP−MISC−PNEUFL, instead code under Warning Loss (SCF−NP−AVION−WRNLS).
- Do not code errors of the pneumatic system warning systems under SCF−NP−MISC−PNEUFL, instead code under Warning Error (SCF−NP−AVION−WRNERR).

HYDRAULIC SYSTEM FAILURE (SCF−NP−MISC−HYDFL)

Any hydraulic system failure that affects safety.

Usage notes:

- Includes failures affecting only part of a redundant system, e.g., loss of one out of three main hydraulic systems.
- Includes leaks, low fluid level, pump failures, loss of pressure, over temperature, and over pressure events.
- Do not code loss of the Hydraulic system pressure, quantity, or temperature systems warning/indicating systems under SCF−NP−MISC−HYDFL, instead code under Warning Loss (SCF−NP−AVION−WRNLS).
- Do not code errors of the Hydraulic system pressure, quantity, or temperature systems warning/indicating systems under SCF−NP−MISC−HYDFL, instead code under Warning Error (SCF−NP−AVION−WRNERR).

CARGO RESTRAINT SYSTEM FAILURE (SCF−NP−MISC−CARGRSTFL)

Failure of the cargo restraint system to restrain the cargo.

Usage notes:

- Includes uncommanded movement of cargo.
- Includes restraint failures such as breaking straps.

ANTI-ICE OR DE-ICE FUNCTION FAILURE (SCF−NP−MISC−ANTICEFL)

Any failure of the anti-ice or de-icing function.

Usage notes:

- Includes loss of engine anti-ice.
- Includes loss of induction icing prevention systems such as carburetor heat.
- Includes wing, horizontal stabilizer, vertical stabilizer, wind shield, propellers, pitot probes, static ports, angle of attack sensors, etc.
- Loss or failure or of icing warning systems should be coded as Warning Loss (SCF−NP−AVION−WRNLS) or Warning Error (SCF−NP−AVION−WRNERR).
- Includes partial losses of anti-ice or de-ice system functions.
- Includes overheating of anti or de-icing system components or adjacent structural members.

FIRE EXTINGUISHING SYSTEM FAILURE (SCF−NP−MISC−FIREEXTFL)

Failure or malfunction of fire extinguishing systems.

Usage notes:

- Includes engine or APU fire extinguishing systems.
- Includes cargo or other non-engine extinguishing systems.
- Hand-held fire extinguishers are to be coded as Other Cabin Systems Malfunction or Failure (SCF−NP−CABIN−OTHR).
- Loss or failure of detection systems should be coded as Warning Loss (SCF−NP−AVION−WRNLS) or Warning Error (SCF−NP−AVION−WRNERR).

EQUIPMENT COOLING LOSS (SCF−NP−MISC−COOLLS)

Loss of or reduction of necessary equipment cooling.

Usage notes:

- Includes any system on the aircraft such as electrical system cooling, avionics cooling, etc.
- Do not code control of cabin temperature under SCF−NP−MISC−COOLLS, instead code under Control of Interior Temperature Loss (SCF−NP−ECS−TEMPCTRLFL).

WIRE STRIKE PROTECTION SYSTEM FAILURE (SCF−NP−MISC−WSPSFL)

A safety significant failure of a Wire Strike Protection System (WSPS).

Usage notes:

- This applies to wire and cable apparatus on rotorcraft and agricultural and firefighting aircraft. These are designed to "cut" a wire or cable such as a high tension line before it can entangle or damage an aircraft.

OTHER MISCELLANEOUS MALFUNCTION OR FAILURE (SCF−NP−MISC−OTHR)

Any other safety-related failure or malfunction of the miscellaneous systems covered in this section.

Usage notes:

- Includes RAT failures such as failure to function or un-containment.
- Includes un-containment of engine accessories such as hydraulic pumps.
- Includes inadvertent deployment or failure to deploy of whole-aircraft parachutes.
- Includes windscreen rain protection system failures.
- Includes ballast Systems system failures.
- Includes agriculural application system failures
- Includes safety-significant events associated with:
  - Agricultural application equipment such as hoppers and spray nozzles.
  - Firefighting systems and equipment.
  - Glider towing equipment.

ROTOR SYSTEMS (RS)

Rotor systems include components used for flight unique to helicopters. The specific system descriptions are included below.

Rotor systems include:

- Main Rotor Drive Systems.
- Tail Rotor Drive Systems.
- No Tail Rotor (NOTAR) Systems.
- Rotor Control Systems.
- Rotor Blades, both Main and Tail.

MAIN ROTOR DRIVE SYSTEM FAILURE (SCF−NP−RS−MRDSFL)

Main Rotor Drive System failure or safety-related discrepancy.

Usage notes:

- Includes failure or safety-related discrepancy in:
  - Main Rotor Mast.
  - Main Rotor Brake.
  - Main Rotor Drive System:
    - Main transmission.
    - Lubrication System.
    - Oil Sensing System.
    - Main Rotor Drive Shaft.
    - Flex Coupling.
    - Sprag Clutch.
    - Swash Plate.
  - Any other component between the engine and transmission.

MAIN ROTOR CONTROL SYSTEM FAILURE (SCF−NP−RS−MRCSFL)

Main Rotor Control System failure or safety-related discrepancy.

Usage notes:

- Includes failure or safety-related discrepancy in control system including:
  - Linkages.
  - Electronic Controls.
  - Hydraulic components.

MAIN ROTOR BLADE FAILURE (SCF−NP−RS−MRBFL)

Main Rotor Blade Failure.

Usage notes:

- Includes failure or safety-related discrepancy in metallic or composite blade components.

MAIN ROTOR HEAD FAILURE (SCF−NP−RS−MRHDFL)

Main Rotor Head Failure.

Usage notes:

- Includes failure or safety-related discrepancy in Main Rotor Heads, including the following components:
  - Main Rotor Grip.
  - Main Rotor Pin/Bolt.
  - Drag Braces.
  - Metallic Bearing.
  - Elastomeric Bearings.
  - Main Rotor Spindle.
  - Main Rotor Hub.
  - Main Rotor Flexure.
  - Main Rotor Trunnion.

TAIL ROTOR DRIVE SYSTEM FAILURE (SCF−NP−RS−TRDSFL)

Tail Rotor Drive System failure or safety-related discrepancy.

Usage notes:

- Includes failure or safety-related discrepancy in:
  - Intermediate Gear Box.
  - Tail Rotor Gear Box.
  - Tail Rotor Drive Shaft.
  - Flex Coupling.
  - Sprag Clutch.
  - Swash Plate.

TAIL ROTOR CONTROL SYSTEM FAILURE (SCF−NP−RS−TRCSFL)

Tail Rotor Control System failure or safety-related discrepancy.

Usage notes:

- Includes failure or safety-related discrepancy in control system including:
  - Linkages.
  - Electronic Controls.
  - Hydraulic components.

NOTAR SYSTEM FAILURE (SCF−NP−RS−NOTARFL)

NOTAR System Failures.

Usage notes:

- Includes failure or safety-related discrepancy in the:
  - Air Intake Fan.
  - Directional Thruster.
  - Tail Boom Slot.
  - NOTAR Controls.

TAIL ROTOR BLADE FAILURE (SCF−NP−RS−TRBFL)

Tail Rotor Blade Failure.

Usage notes:

- Includes failure or safety-related discrepancy in metallic or composite blade components.
  - Main Rotor Retention Device.

TAIL ROTOR HEAD FAILURE (SCF−NP−RS−TRHDFL)

Tail Rotor Head Failure.

Usage notes:

- Includes failure or safety-related discrepancy in Tail Rotor Heads, including the following components—
  - Tail Rotor Grip.
  - Tail Rotor Pin/Bolt.
  - Drag Braces.
  - Metallic Bearing.
  - Elastomeric Bearings.
  - Tail Rotor Spindle.
  - Tail Rotor Hub.
  - Tail Rotor Flexure.
  - Tail Rotor Trunnion.
  - Tail Rotor Retention Device.

OTHER ROTOR SYSTEM MALFUNCTION OR FAILURE (SCF−NP−RS−OTHR)

Any other safety-related failure or malfunction of a rotor system.

STRUCTURES (STRUCT)

Aircraft structure includes:

- Fuselage, wing, empennage, pylons, etc., and the components that they are assembled from such as skins, stringers, longerons, chords, frames, clips, struts, truss members, fabric covering (dope and fabric construction), fasteners, etc.
- Includes subcomponents such as doors, windows, accessory compartments, battery boxes, electronic shelves, etc.
- Do not code helicopter rotor blades under Structures, instead code under Rotor Systems (RS).
- Do not code structural failure of landing gear under Structures, instead code under Landing Gear (LG).

SEPARATION OF LARGE ITEMS FROM AIRCRAFT (SCF−NP−STRUCT−PDA)

Large or massive part departing aircraft.

Usage notes:

- Landing gear separation should be dually coded using both Separation of Large Items From Aircraft (SCF−NP−STRUCT−PDA) and Landing Gear Structural Failure (SCF−NP−LG−STRUCTFL).
- If the control surface that departed the airplane was large it should be dually coded using both SCF−NP−STRUCT−PDA and Separation of Control Surfaces (SCF−NP−STRUCT−CTRLSFC).

SEPARATION OF CONTROL SURFACES (SCF−NP−STRUCT−CTRLSFC)

Separation of control surfaces, including control tabs, from the aircraft.

Usage notes:

- Includes complete separation of whole or part of a control surface.
- Includes partial separation of a control surface (still on aircraft, but not completely attached).
- If the control surface that departed the airplane was large it should be dually coded using both Separation of Control Surfaces (SCF−NP−STRUCT−CTRLSFC) and Separation of Large Items From Aircraft (SCF−NP−STRUCT−PDA).

CONTROL SURFACE VIBRATION (SCF−NP−STRUCT−CTRLSFCVIB)

Control surface vibration, flutter, or buzz.

Usage notes:

- This includes excessive free play.
- Includes control surfaces that are found to be incorrectly balanced.

BREACH OF PRESSURIZED FUSELAGE SKIN (SCF−NP−STRUCT−PRFSBR)

Breach of the pressurized fuselage skin or skin doublers due to structural failure.

Usage notes:

- Includes breaches from any cause (e.g., fatigue, stress corrosion cracking, breaking due to overload, extreme corrosion, etc.).
- Includes breaches due to bird strikes.
- Includes pressurized fuselage bulkhead breaches.
- If the cabin is not pressurized, code under Cracks in Primary Structure (SCF−NP−STRUCT−CRK).
- Includes breaches of metallic and composite structure.
- Excludes accidental damage occurring on the ground that is known at the time of damage (obvious damage, e.g., ground service trucks collides with aircraft).

CABIN DECOMPRESSION (SCF−NP−STRUCT−DECOMP)

Cabin decompression due to a structural failure.

Usage notes:

- Includes explosive, rapid, or slow decompression due to a structural failure.
- Do not code decompression associated with failures of the pressurization system under SCF−NP−STRUCT−DECOMP, instead code as Cabin Decompression (SCF−NP−ECS−DECOMP).

CRACKS IN AIRCRAFT STRUCTURE (SCF−NP−STRUCT−CRK)

Cracks and fractures in aircraft structure that are safety-significant.

Usage notes:

- Cracking of primary structure is safety-significant. Cracking of secondary structure typically is not, but may be, safety-significant.
- Includes cracks from any cause (e.g., fatigue, stress corrosion cracking, breaking due to understrength, etc.).
- Excludes accidental damage occurring on the ground that is known at the time of damage (obvious damage, e.g., ground service trucks collides with aircraft).
- Cracking in pressurized fuselage skin or pressure bulkheads is coded as Breach of Pressurized Fuselage Skin (SCF−NP−STRUCT−PRFSBR).
- Includes metallic, composite, and wood structure.
- Includes cracked or broken bolts, pins, and fasteners.

CORROSION (SCF−NP−STRUCT−CORR)

Corrosion of structure that is safety-significant.

Usage notes:

- Includes dry rot of wood structure.
- Includes degradation of fabric coverings used in dope and fabric construction.
- Includes any corrosion-related degradation of metal or composite structure.

CABIN WINDOW PROBLEMS (SCF−NP−STRUCT−CABINWDW)

Cabin or side window problems that are safety-significant.

Usage notes:

- "Side windows" includes non-pressurized side windows in small aircraft.
- Excludes crazing.
- Includes cracking of windows.
- Includes separation or loss of windows.

FLIGHT DECK WINDOW PROBLEMS (SCF−NP−STRUCT−FLTDKWDW)

Flight deck or forward wind screen window problems that are safety-significant.

Usage notes:

- Excludes crazing.
- Includes cracking of windows.
- Includes separation or loss of windows.
- Includes bird or foreign object debris penetration of window.
- Do no code electrical problems under SCF−NP−STRUCT−FLTDKWDW, instead code under Electrical Power Systems (ELEC).

COMPOSITE DELAMINATION (SCF−NP−STRUCT−DELAM)

Delamination or disbonding of composite structure.

Usage notes:

- Includes delamination between plies.
- Includes disbonding between a face sheet and a honeycomb core.
- Do not code failures of composite rotor blades under SCF−NP−STRUCT−DELAM, instead code under Main Rotor Blade Failure (SCF−NP−RS−MRBFL) or Tail Rotor Blade Failure (SCF−NP−RS−TRBFL).

COMPOSITE HONEYCOMB CORE FAILURE (SCF−NP−STRUCT−HCFL)

Safety-significant problems with a sandwich honeycomb core.

Usage notes:

- Includes crushed core.
- Includes liquid impregnated core.

OTHER STRUCTURES MALFUNCTION OR FAILURE (SCF−NP−STRUCT−OTHR)

Any other safety-related failure or malfunction of the aircraft structure.

Usage notes:

- None at this time.

APPENDIX A
CODE ABBREVIATIONS

ABRKERR	Automatic Braking Operation Error
ABRKLS	Automatic Braking Loss
AFC	Automatic Flight Controls (Autopilot, Autothrottle, Autothrust)
ALTERR	Altitude Information Error
ALTLS	Altitude Information Loss
ANTICEFL	Anti Ice Or De Ice Function Failure
AOAERR	Angle Of Attack Information Error
AOALS	Angle Of Attack Information Loss
AOPFL	Unmanned Aircraft Following Autonomous Operation Program Failure
APERR	Autopilot Control Or Guidance Error
APLS	Autopilot Function Loss
APMCFL	Autopilot Mode Change Annunciation Failure
APUFL	Auxiliary Power Unit Failure
ARC	Arcing
ASERR	Airspeed Information Error
ASLS	Airspeed Information Loss
ATERR	Automatic Thrust Control Error
ATLS	Automatic Thrust Control Unavailable Or Loss
ATTERR	Attitude Information Error
ATTLS	Attitude Information Loss
AUTOPROTFL	Automatic Protection Functions Failure

AVION	Avionics Systems
BRKFL	Brake System Failure
CABIN	Cabin Systems
CABINWDW	Cabin Window Problems
CAPFL	Cabin Attendant Panels Failure
CARGRSTFL	Cargo Restraint System Failure
COMMLS	Communication Loss
CONTAM	Contaminated
COOLLS	Equipment Cooling Loss
CORR	Corrosion
CRK	Cracks In Aircraft Structure
CTRL	Control
CTRLSFC	Separation Of Control Surfaces
CTRLSFCVIB	Control Surface Vibration
DECOMP	Cabin Decompression
DELAM	Composite Delamination
DROPUNC	Uncommanded Door Operation
DULS	Integrated Display Unit Loss
ECS	Environmental Control Systems
ELEC	Electrical Power Systems
ELITFL	Emergency Lighting Failure
EXITFL	Emergency Exit Failure
EXTFL	Landing Gear Extend Failure
FC	Flight Control Systems

FIREEXTFL	Fire Extinguishing System Failure
FLOTFL	Flotation System Failure
FLTDKWDW	Flight Deck Window Problems
FMIERR	Flight Management Information Error
FUEL	Fuel Systems
GAFL	Galley System Failure
GENLS	Electrical Generating Capability Loss
GSLOCERR	Precision Approach Information Error
HCFL	Composite Honeycomb Core Failure
HDGERR	Heading Information Error
HDGLS	Heading Information Loss
HYDFL	Hydraulic System Failure
IMB	Imbalance
INDFL	Indication Failure
JETTFL	Jettison Failure
LG	Landing Gear
LINKLS	Command And Control Link Loss
LK	Leak
MISC	Miscellaneous Systems
MRBFL	Main Rotor Blade Failure
MRCSFL	Main Rotor Control System Failure
MRDSFL	Main Rotor Drive System Failure
MRHDFL	Main Rotor Head Failure
NAVERR	Navigation Information Error

NAVLS	Navigation Information Loss
NGRLFL	Negative Pressure Relief Valve Failure
NOTARFL	NOTAR System Failure
NP	Non-Powerplant
OTHR	Other Malfunction Or Failure
O2PILFL	Pilot Oxygen Failure
OTHR	Other Malfunction Or Failure
PDA	Separation Of Large Items From Aircraft
PNEUFL	Pneumatic System Failure
PRFL	Pressurize Cabin Failure
PRFSBR	Breach Of Pressurized Fuselage Skin
PROVER	Cabin Over Pressurization
RESTFL	Personnel Restraint System Failure
RETFL	Landing Gear Retract Failure
RS	Rotor Systems
SCF	System Component Failure
SEATFL	Aircraft Seat Failure
SEATMVUNC	Uncommanded Movement Of Pilot Seat
SFBWREV	Fly By Wire Reversion
SFRCCHG	Significant Changes In Control Force
SMKPERSIS	Inability To Clear Smoke From Flight Deck
SMVFL	Flight Control Surface To Move As Commanded Failure
STEERFL	Steering System Failure

STRUCT	Structures
STRUCTFL	Structural Failure
SUNCMV	Uncommanded Flight Control Movement
SYSMALF	System Malfunction
TEMPCTRLFL	Control Of Interior Temperature Loss
TIREFL	Tire Failure
TNKPR	Tank Pressure
TRBFL	Tail Rotor Blade Failure
TRCSFL	Tail Rotor Control System Failure
TRDSFL	Tail Rotor Drive System Failure
TRHDFL	Tail Rotor Head Failure
VIB	Landing Gear Vibration
WHLFL	Wheel Failure
WIREDMG	Wire Damage
WRNERR	Warning Error
WRNLS	Warning Loss
WSPSFL	Wire Strike Protection System Failure

APPENDIX B
AVIATION ACRONYMS

ADF	automatic direction finder
ADS−B	Automatic Dependent Surveillance−Broadcast
AFC	Automatic Flight Control
APU	Auxiliary Power Unit
CAST	Commercial Aviation Safety Team
CICTT	CAST/ICAO Common Taxonomy Team
DME	distance measuring equipment
GPS	Global Positioning System
ICAO	International Civil Aviation Organization
LORAN	long-range navigation
NOTAR	No Tail Rotor
RAT	Ram Air Turbine
RPS	Remote Pilot Station
UA	Unmanned Aircraft
UAS	Unmanned Aircraft System
VOR	very high frequency omnidirectional range
WSPS	Wire Strike Protection System