Direction des
Services de la
Navigation
Aérienne

Mission
Sécurité
Qualité
Sûreté

EPIS: Preliminary Analysis of Safety Impact
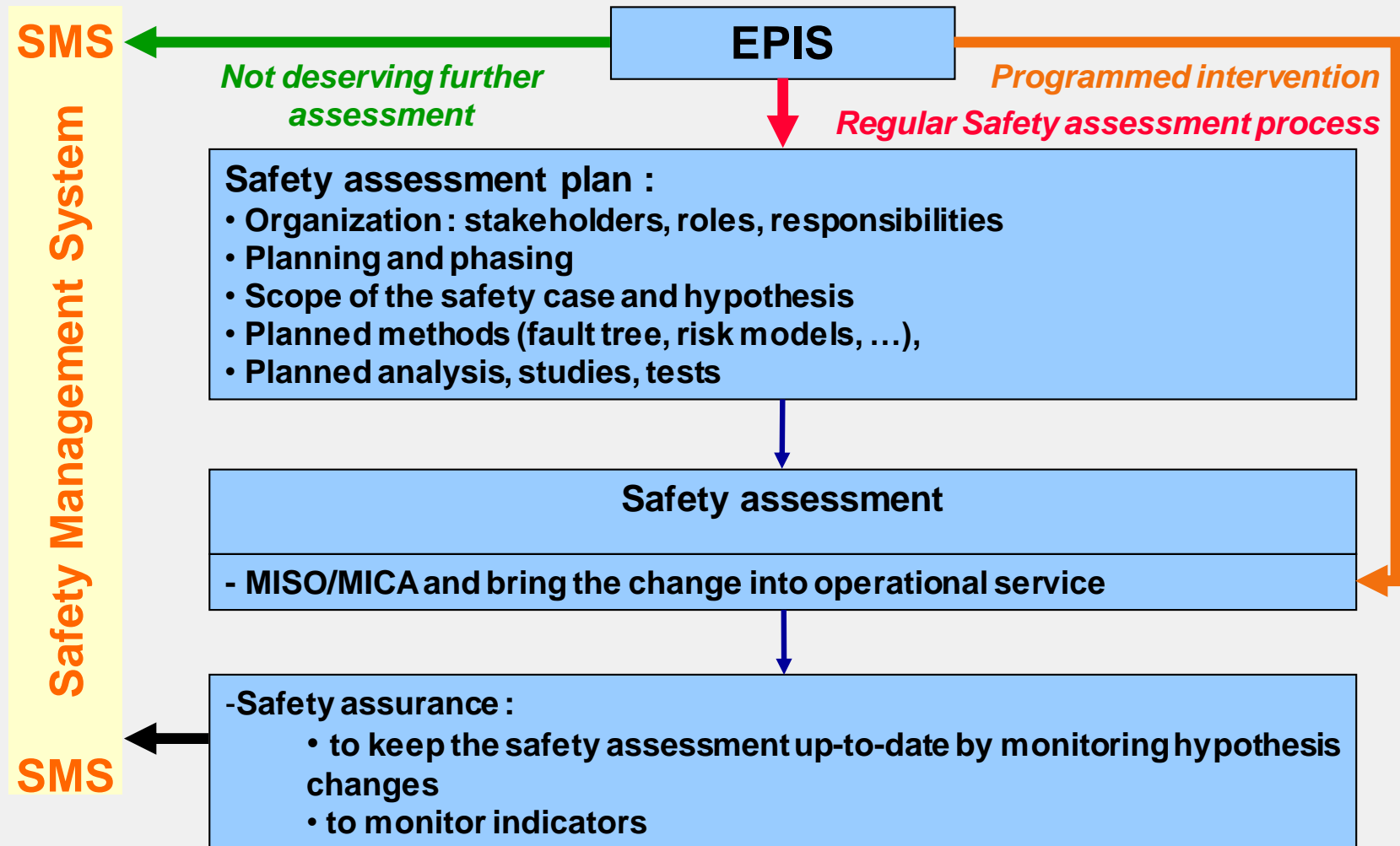## (Evaluation Préliminaire d'Impact sur la Sécurité)
What is a Change ?

Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE

ministère
de l'Équipement
des Transports
et du Logement

ESARR4 Severity Class

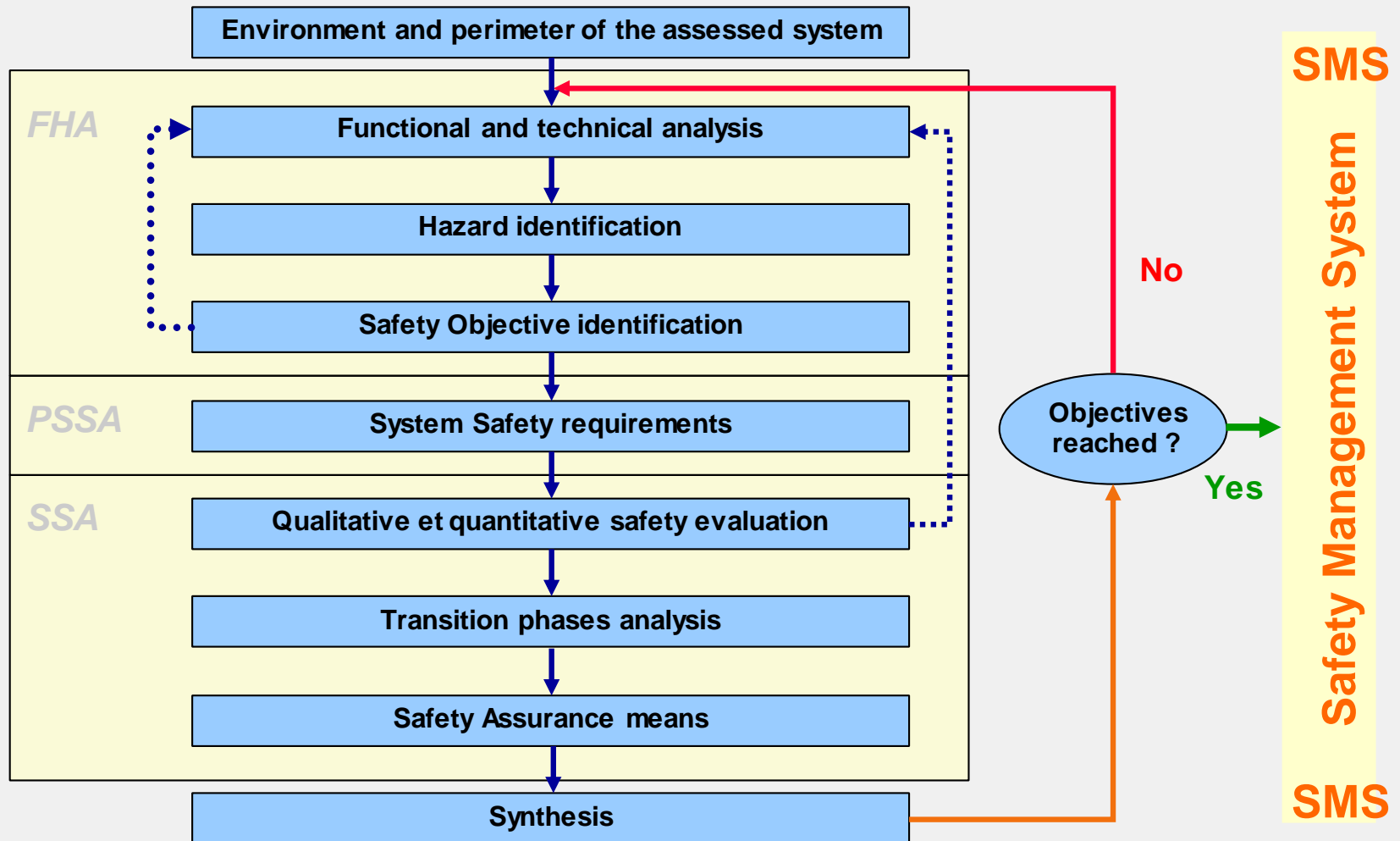| Severity Class	1 [Most Severe]	2	3	4	5 No safety effect [Least Severe]
Effect on Operations*)	Accidents	Serious incidents	Major incidents	Significant incidents	No immediate effect on safety
Examples of effects on operations Include*):	❑ one or more catastrophic accidents, ❑ one or more mid-air collisions ❑ one or more collisions on the ground between two aircraft ❑ one or more Controlled Flight Into Terrain ❑ total loss of flight control. No independent source of recovery mechanism, such as surveillance or ATC and/or flight crew procedures can reasonably be expected to prevent the accident(s).	❑ large reduction in separation (e.g., a separation of less than half the separation minima), without crew or ATC fully controlling the situation or able to recover from the situation. ❑ one or more aircraft deviating from their intended clearance, so that abrupt manoeuvre is required to avoid collision with another aircraft or with terrain (or when an avoidance action would be appropriate).	❑ large reduction (e.g., a separation of less than half the separation minima) in separation with crew or ATC controlling the situation and able to recover from the situation. ❑ minor reduction (e.g., a separation of more than half the separation minima) in separation without crew or ATC fully controlling the situation, hence jeopardising the ability to recover from the situation (without the use of collision or terrain avoidance manoeuvres).	❑ increasing workload of the air traffic controller or aircraft flight crew, or slightly degrading the functional capability of the enabling CNS system. ❑ minor reduction (e.g., a separation of more than half the separation minima) in separation with crew or ATC controlling the situation and fully able to recover from the situation.	No hazardous condition i.e. no immediate direct or indirect impact on the operations.

Synthesis of ESARR4 transposition in France

Severity of the worst credible effects	Creation or modification
1 (accident) 2 (serious incident) 3 (major incident)	- Safety case plan - Safety case
4 (significant incident) 5 (no immediate effect)	EPIS + justification put at regulator's disposal (database, audits,…)

EPIS in Global context

SMS ← *Not deserving further assessment*

EPIS

Programmed intervention

Regular Safety assessment process

Safety Management System

Safety assessment plan :
- **Organization : stakeholders, roles, responsibilities**
- **Planning and phasing**
- **Scope of the safety case and hypothesis**
- **Planned methods (fault tree, risk models, …),**
- **Planned analysis, studies, tests**

Safety assessment

- MISO/MICA and bring the change into operational service

-**Safety assurance :**
- **to keep the safety assessment up-to-date by monitoring hypothesis changes**
- **to monitor indicators**

SMS

Safety assessment

Environment and perimeter of the assessed system

FHA
- Functional and technical analysis
- Hazard identification
- Safety Objective identification

PSSA
- System Safety requirements

SSA
- Qualitative et quantitative safety evaluation
- Transition phases analysis
- Safety Assurance means

Synthesis

Objectives reached ?

No

Yes

SMS

Safety Management System

SMS

EPIS in a project

- ### Simplified temporal scale

   Example : case of new system

   T- x months   **T- x weeks**   **T**

   | Mentor (Project Management Tool) |

   EPIS

   Safety Plan and Safety Case **MISO**

   Safety Assurance

   Beginning of the Projet   **Put in operation after formal decision**   **End of the Project**
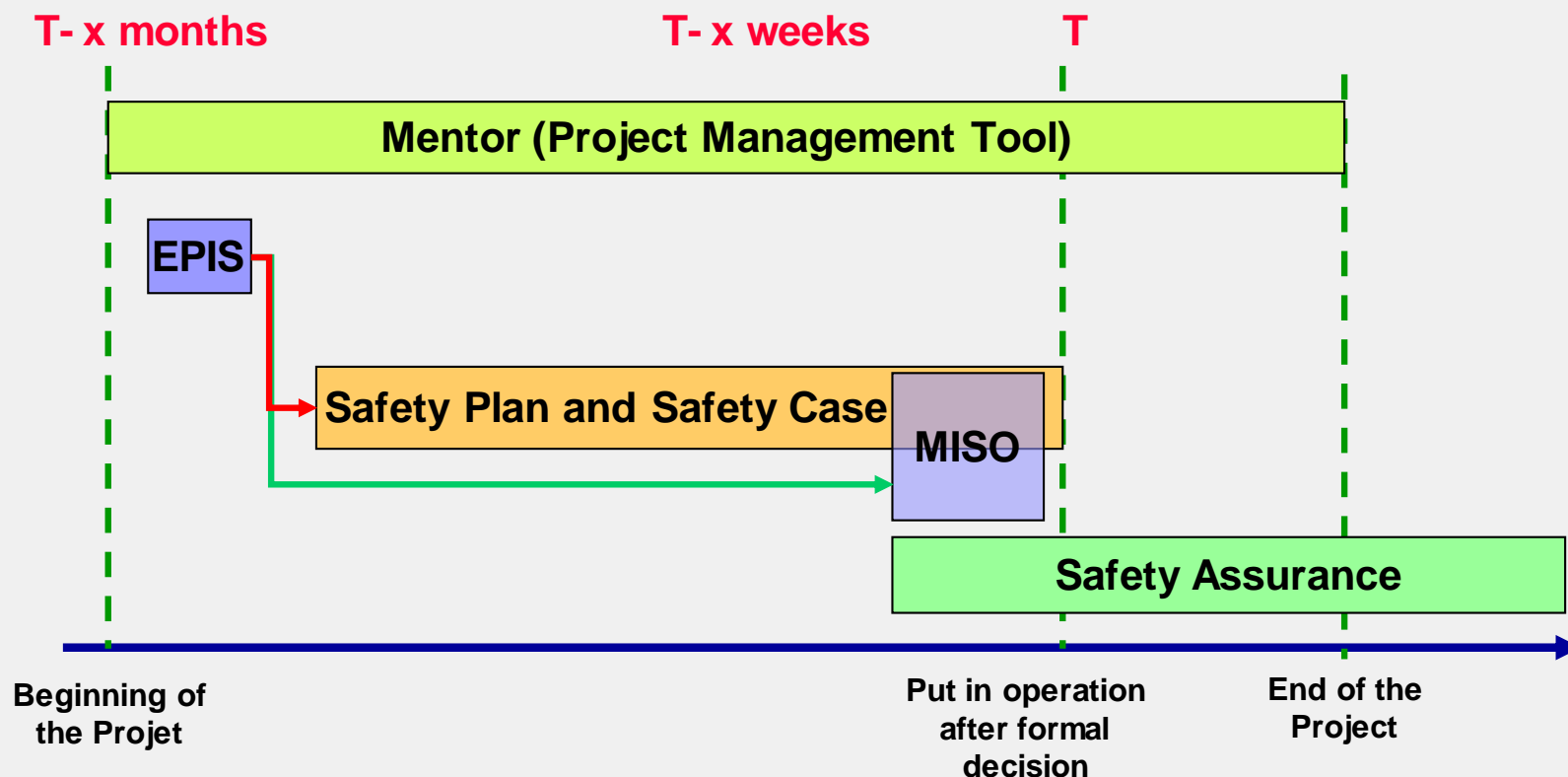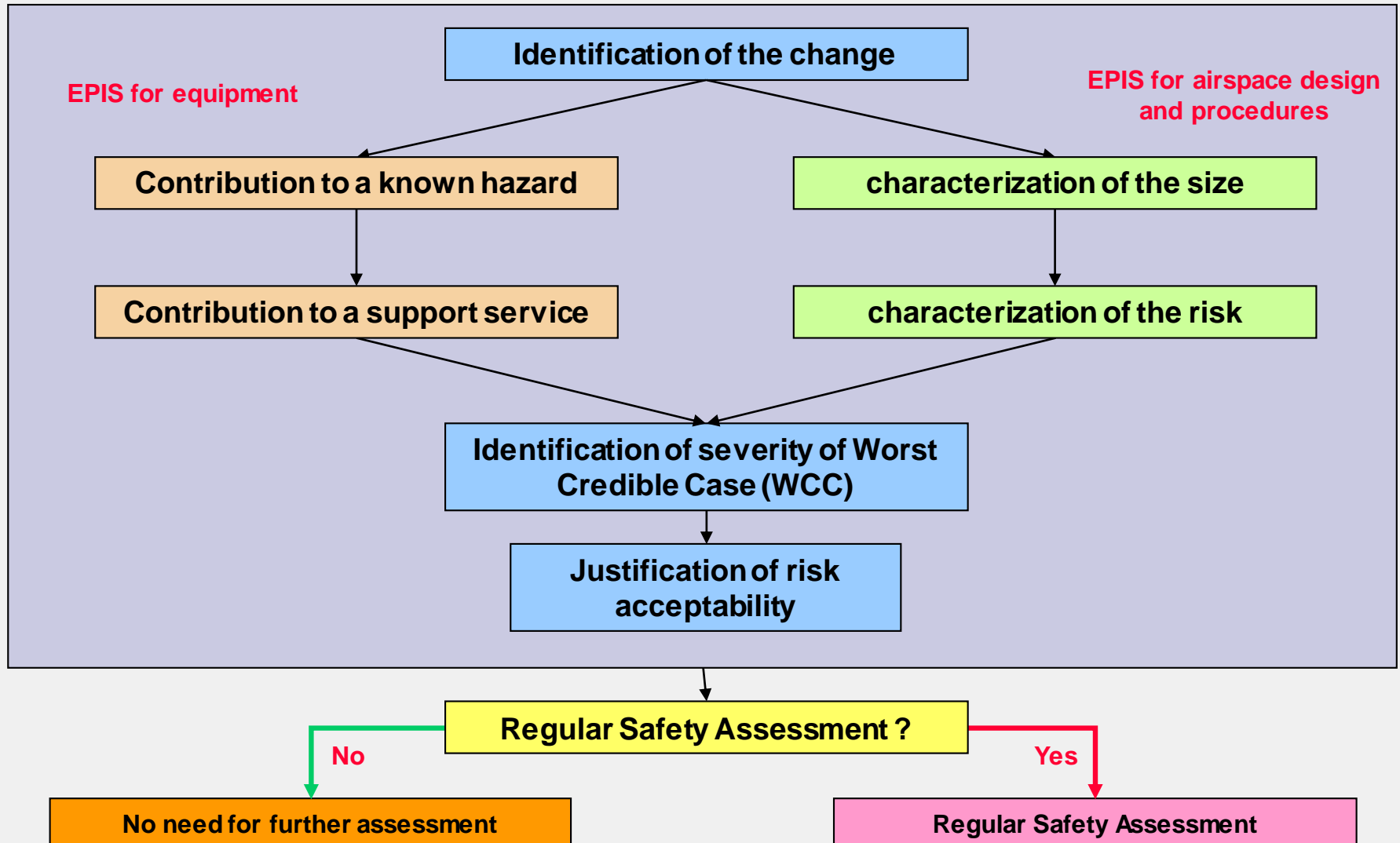
   MISO : Intervention Methodology on Operational system
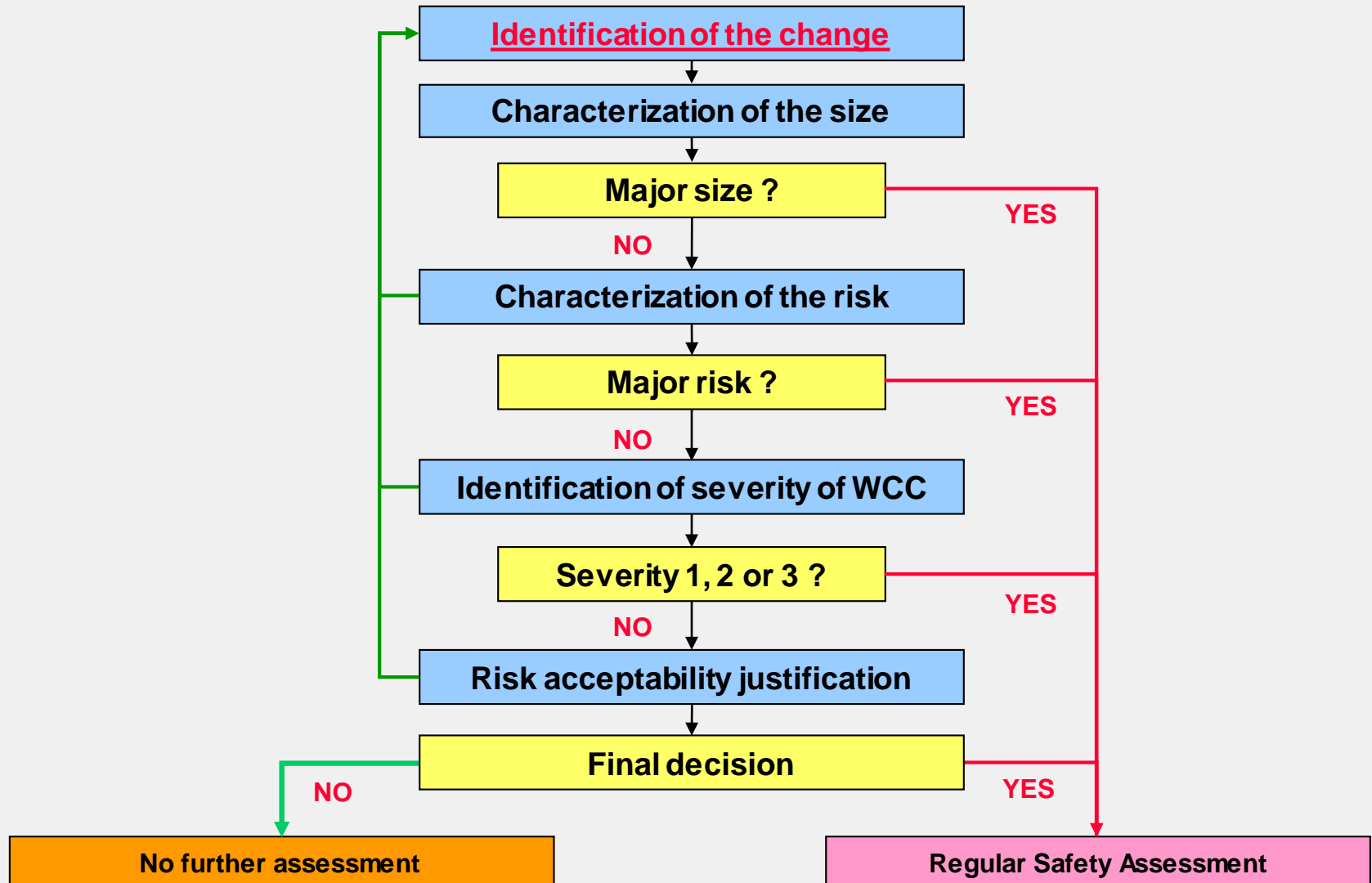   MENTOR : National Method for Organisation and Risk management in a Project

EPIS type of change

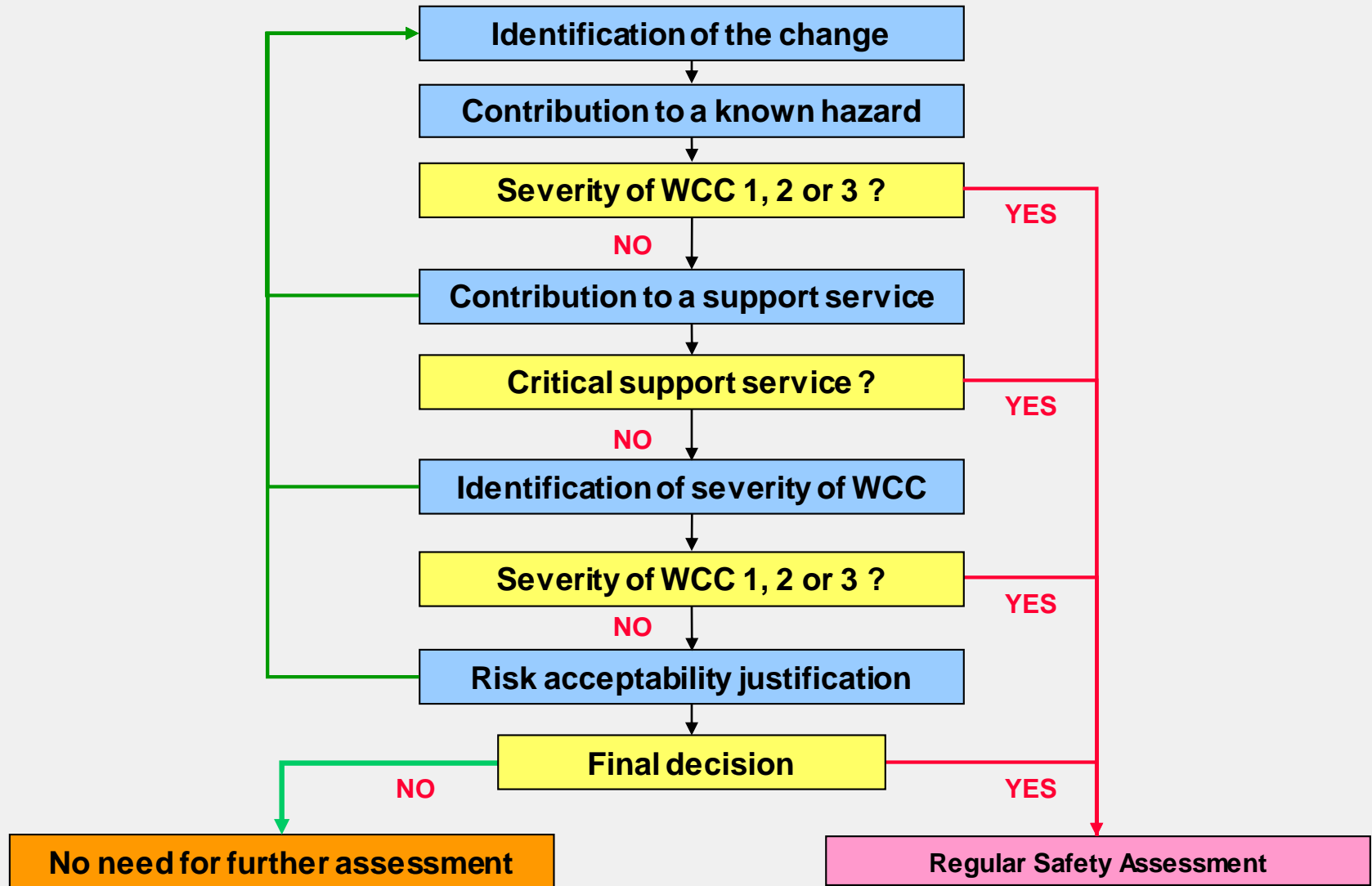| Type of change	Creation or modification of an existing system	Programmed (banal) intervention
Change on a technical system	New function, system, system upgrade,…	Update of monthly ATC Data (list of beacons, airways,..), system parameters,
Change on air-space design or procedure	New ILS procedure, sectors design, SID and STAR trajectories	Recurrent but irregular dropping, Monaco Grand Prix (to be precised)

EPIS global process

EPIS-Airspace process

Identification of the change

Characterization of the size

Major size ? — YES

NO

Characterization of the risk

Major risk ? — YES

NO

Identification of severity of WCC

Severity 1, 2 or 3 ? — YES

NO

Risk acceptability justification

Final decision — YES

NO

No further assessment

Regular Safety Assessment

EPIS for equipment

EPIS Technical

◆ **Based on support services (still in progress)**

	Support services (EXTRACT)	Severity level
S1	**Air ground communications**	**1-2**
	H1 : unavailability of most of the frequencies of a control centre	1
	H2 : unavailability of a significant number of frequencies of a control centre	2
S2	**Ground ground communications**	**2-4**
	H1 : non detected data corruption or unavailability of the safety interphone used on parallel approaches	2
	H2 : unavailability of OLDI, of the civil-military coordination, of the safety phone system	4
S3	**Air surveillance**	**2-3**
	H1 : loss of all surveillance images (normal, backup, ultimate backup) on all the control working positions of a control centre	2
	H2 : loss of flight identification on all flight labels of a control centre	3

List of support services (2)

S4	Acquisition, management, distribution et presentation of flight plan information	3
	H : corruption of a flight plan data entry	3
S5	**Recording and restitution**	**?-5**
S5a	Real time recording and restitution	?
S5b	Differed recording and restitution	5
S6	**Visualisation of areas with a particular status**	**2**
	H : disappearing or non display of dynamic maps	2
S7	**Management of the control room**	**3**
	H : impossibility to degroup sectors while the traffic load is rapidly increasing	3
S8	**Tactical and pre-tactical ASM/ATFM assistance**	**4**
	H : loss of monitoring of the traffic load to come while the traffic load is rapidly increasing	4

List of support services (3)

S9	**Navigation aids**	**1**
S9a	Navigation aids for landing and take off (ILS, MLS, light markings, …)	1- ?
	H1 : failure of the ILS while an aircraft is landing or taking off under LVP (low visibility procedure) and high precision conditions	1
	H2 : TBD	
S9b	Navigation aids for en-route and approach, except landings and takes off (VOR, DME, GPS, …)	?
	H : TBD	
S10	**Management of ground movements (ground surveillance, control, guidance, routing)**	**2**
	H : failure of SMGCS under LVP and without stops	2

List of support services (4)

S11	**Presentation of general and aeronautical information (weather, gliding measures, QNH, Notams, aeronautical publications, etc.)**	**4**
	H : non presentation of an important Notam (ex: closing of an airport) or of weather information	4
S12	**Decision aids (including MTCD)**	**2-3**
	H : non detected data corruption	**2-3**
S13	**Operational maintenance**	**?**
S14	**Safety nets (STCA, MSAW, APW, RIMCAS)**	**?**

EPIS Technical

◆ **Based on lists of example studied hazards**
  ❍ **example of hazards**

Serv. Support / No	Hazard (ACC level)	Detection duration	Initial severity	Final severity	Consequences	Safety barriers	Possible causes
~ S3S4 C1a	Loss of all control position in ACC (no backup radar image, no FPL) for more than 45 sec	12 s	2	2	No radar image	Control using available strips. Traffic regulation.	Common Middleware failure
~ S3S4 C1b	Loss of all control position in ACC (no backup radar image, no FPL) for less than 45 sec	12 s	2	3	No radar image	Control using available strips. Track extrapolation markers used.	Common Middleware failure