IRSN
INSTITUT
DE RADIOPROTECTION
ET DE SÛRETÉ NUCLÉAIRE

Faire avancer la sûreté nucléaire

On-Site/Off-Site interface for an effective emergency management

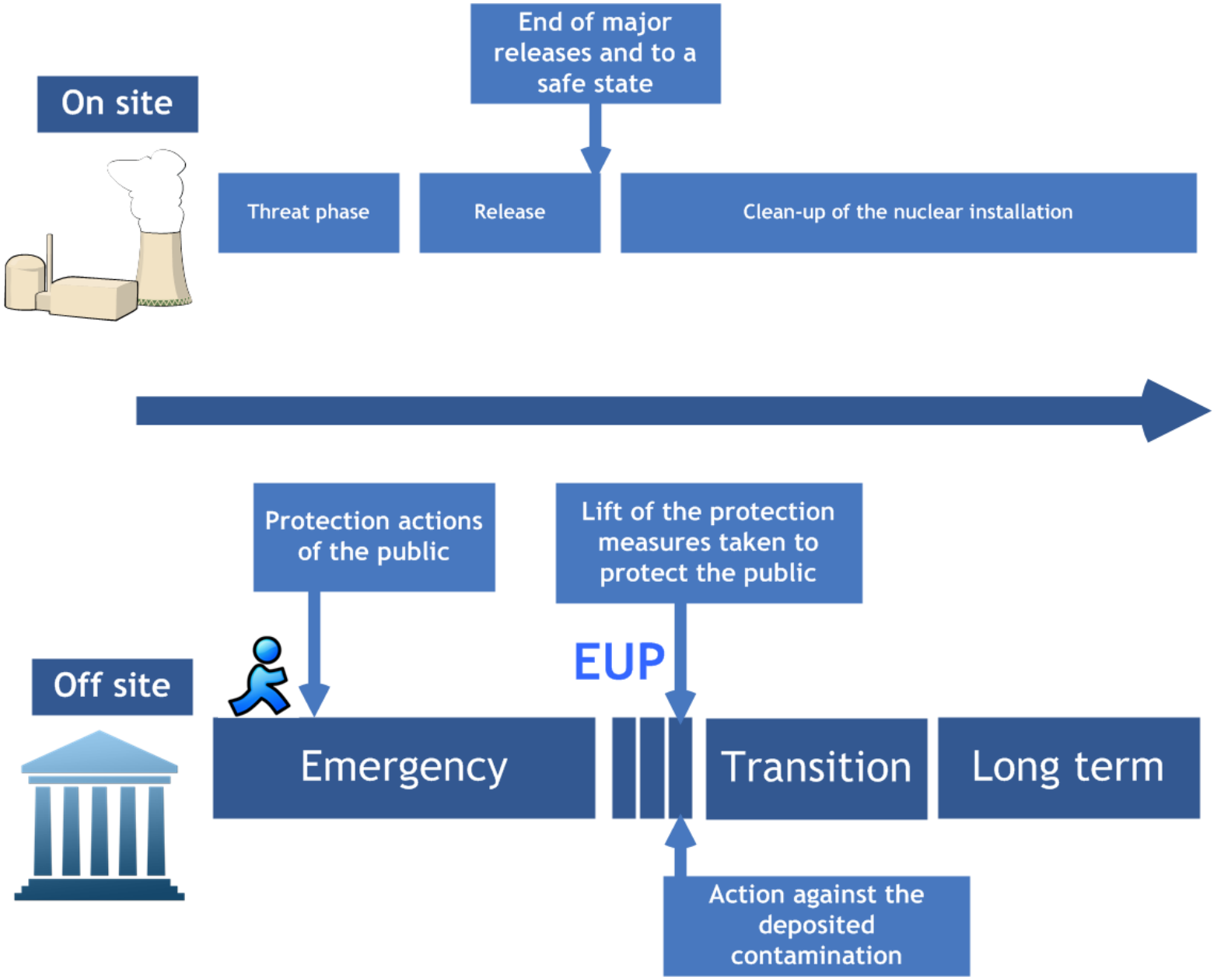
O. Isnard
IRSN
Radiation Protection Division – Emergency
Emergency Response Department

There must be a clear distinction between the responsabilities of the operator and off-site organizations (public authorities).

Main Objectives

- To regain control of the situation at the nuclear installation
- To prevent and/or mitigate consequences on site
- To render first aid (to operator personnel)
- **To prevent the occurrence of deterministic health effects in worker and for the public**
- **To prevent to the extend practical the occurrence of stochastic health effects in the population**
- To protect to the extend practical the environement
- Inform the public

Overall objectives for an Emergency Response



Both the operator and the off-site organizations (local/national) shall have some planning in place

Main Objectives (On-Site)

- **Identify/Take action/Alert & inform**
- Get a written concept of operation which will serve as a new organisazion system for the operator
- Identify in advance possible scenarios with typical radiological consequences
- Have a shared and understood warning system for notification
- Have a system in place to inform the public

Both the operator and the off-site organizations (local/national) shall have some planning in place

Main Objectives (Off-site)

- **Public Health/Environment quality/Economic and social continuity/International relations**
- Get a written concept of operation which will serve as a new organization system for the responder agencies
- Identify in advance possible situations and appropriate response
- Get areas around the installation where prompt actions (protection) can be taken if needed (justification)
- Get a effective system to coordinate and inform at the international level
- Have a system in place to inform the public

Threat phase | Release phase | Post-accidental phase

ON SITE

On site emergency plan

OFF SITE

Off site emergency plan

Guide for the exit of the emergency phase

Long term guidelines

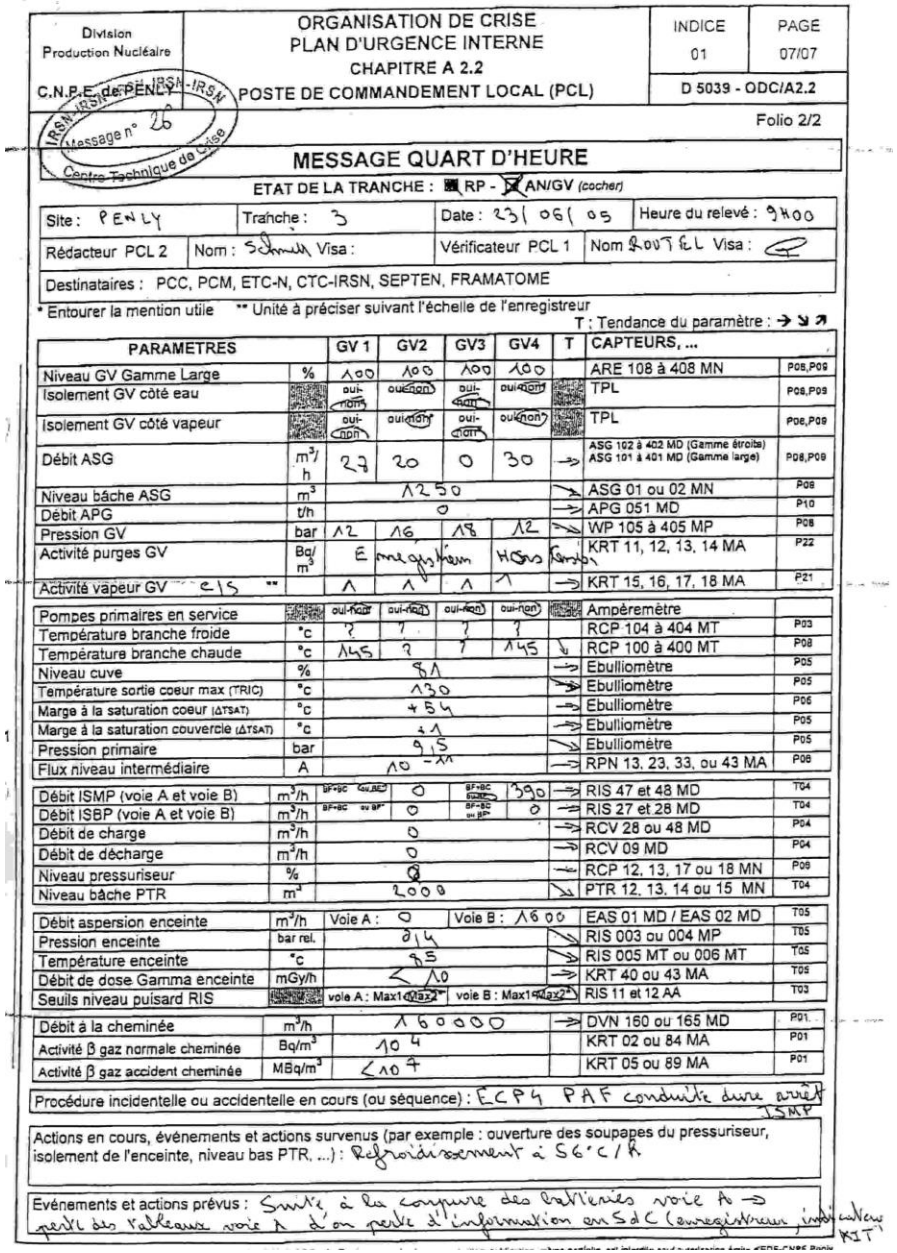
- **The response to an nuclear/radiological emergency is an operation which must be done as partners (operator/public organization)**
- The operator on-site may have an incorrect view of the situation and its possible development. There is a need for technical relations between the operator and a public technical asset
- There is a need to coordinate actions between on-site and off-site: extra resources to be sent on site, evacuation of the site, protection of the public, measurements in the environment…
- The communication towards the public must also be coordinated between on-site and off-site (public trust)

- Planning is important but as a start during any response
- The situation to face is highly uncertain and many evolutions may occur. It is impossible to plan for everything and this is one of the major limitations of the planning to be prepared during the preparedness phase.
- The situation to face will be different than the ones to which the response system is prepared for. There is a strong need to have a response which is highly adaptive in all dimensions
- Some decisions should have been planned in advance in regards to identified conditions (on-site but also with meteorological conditions)
- There is a strong need for a reactive and efficient expertise made conjointly by the operator and public entities

- **The response to a nuclear/radiological emergency is an operation which must be done as partners (operator/public organization)**
- An effective emergency response requires sharing all information between stakeholders of the response. The information to be shared shall be defined during the preparedness phase with the operator and resilient exchange systems put in place
- Technical data from the accident installation shall be transmitted by the operator to public assets in order to cross check vision of the actual state of the installation but also share vision on possible developments.
- Stay humble. Many mistakes or misunderstanding can occur. Sharing vision on the accident is an important process of an effective response

Example of simple data exchange between the operator and IRSN Technical Emergency Centre

- Need to establish at the preparedness phase the data to be exchanged
- Automatic data transmission is preferable
  - Allow to run expertise in parallel
  - Does not require extra resources from the operator



Division Production Nucléaire — C.N.P.E. de PENLY

ORGANISATION DE CRISE
PLAN D'URGENCE INTERNE
CHAPITRE A 2.2
POSTE DE COMMANDEMENT LOCAL (PCL)

INDICE 01 — PAGE 07/07
D 5039 - ODC/A2.2
Folio 2/2

IRSN-IRSN-IRSN Message n° 26 Centre Technique de Crise

MESSAGE QUART D'HEURE

ETAT DE LA TRANCHE : RP - AN/GV (cocher)

Site : PENLY | Tranche : 3 | Date : 23/06/05 | Heure du relevé : 9H00

Rédacteur PCL 2 | Nom : Schmitt Visa : | Vérificateur PCL 1 | Nom ROUTEL Visa :

Destinataires : PCC, PCM, ETC-N, CTC-IRSN, SEPTEN, FRAMATOME

* Entourer la mention utile ** Unité à préciser suivant l'échelle de l'enregistreur

T : Tendance du paramètre : → ↘ ↗

PARAMETRES		GV 1	GV2	GV3	GV4	T	CAPTEURS, ...	
Niveau GV Gamme Large	%	100	100	100	100		ARE 108 à 408 MN	P08,P09
Isolement GV côté eau		oui-non	oui-non	oui-non	oui-non		TPL	P08,P09
Isolement GV côté vapeur		oui-non	oui-non	oui-non	oui-non		TPL	P08,P09
Débit ASG	m³/h	27	20	0	30	→	ASG 102 à 402 MD (Gamme étroite) ASG 101 à 401 MD (Gamme large)	P08,P09
Niveau bâche ASG	m³	1250				↘	ASG 01 ou 02 MN	P08
Débit APG	t/h	0				→	APG 051 MD	P10
Pression GV	bar	12	16	18	12	→	WP 105 à 405 MP	P08
Activité purges GV	Bq/m³	E			Hors Gamme	→	KRT 11, 12, 13, 14 MA	P22
Activité vapeur GV **		A	A	A	A	→	KRT 15, 16, 17, 18 MA	P21
Pompes primaires en service		oui-non	oui-non	oui-non	oui-non		Ampèremètre	
Température branche froide	°c	?	?	?	?		RCP 104 à 404 MT	P03
Température branche chaude	°c	145	?	?	145	↘	RCP 100 à 400 MT	P08
Niveau cuve	%	81				→	Ebulliomètre	P05
Température sortie coeur max (TRIC)	°c	130				↘	Ebulliomètre	P05
Marge à la saturation coeur (ΔTSAT)	°c	+54				→	Ebulliomètre	P06
Marge à la saturation couvercle (ΔTSAT)	°c	+1				→	Ebulliomètre	P05
Pression primaire	bar	9,5				↘	Ebulliomètre	P05
Flux niveau intermédiaire	A	10 -11				→	RPN 13, 23, 33, ou 43 MA	P08
Débit ISMP (voie A et voie B)	m³/h	BF+BC ou BAS	0		BF+BC ou BAS	390	→	RIS 47 et 48 MD	T04
Débit ISBP (voie A et voie B)	m³/h	BF+BC ou BP	0		BF+BC ou BP	0	→	RIS 27 et 28 MD	T04
Débit de charge	m³/h	0				→	RCV 28 ou 48 MD	P04
Débit de décharge	m³/h	0				→	RCV 09 MD	P04
Niveau pressuriseur	%	Ø				→	RCP 12, 13, 17 ou 18 MN	P08
Niveau bâche PTR	m³	2000				↘	PTR 12, 13, 14 ou 15 MN	T04
Débit aspersion enceinte	m³/h	Voie A : 0			Voie B : 1600		EAS 01 MD / EAS 02 MD	T05
Pression enceinte	bar rel.	0,4				↘	RIS 003 ou 004 MP	T05
Température enceinte	°c	95				→	RIS 005 MT ou 006 MT	T05
Débit de dose Gamma enceinte	mGy/h	< 10				→	KRT 40 ou 43 MA	T05
Seuils niveau puisard RIS		voie A : Max1 Max2			voie B : Max1 Max2		RIS 11 et 12 AA	T03
Débit à la cheminée	m³/h	160000				→	DVN 160 ou 165 MD	P01
Activité β gaz normale cheminée	Bq/m³	10⁴					KRT 02 ou 84 MA	P01
Activité β gaz accident cheminée	MBq/m³	<10⁴					KRT 05 ou 89 MA	P01

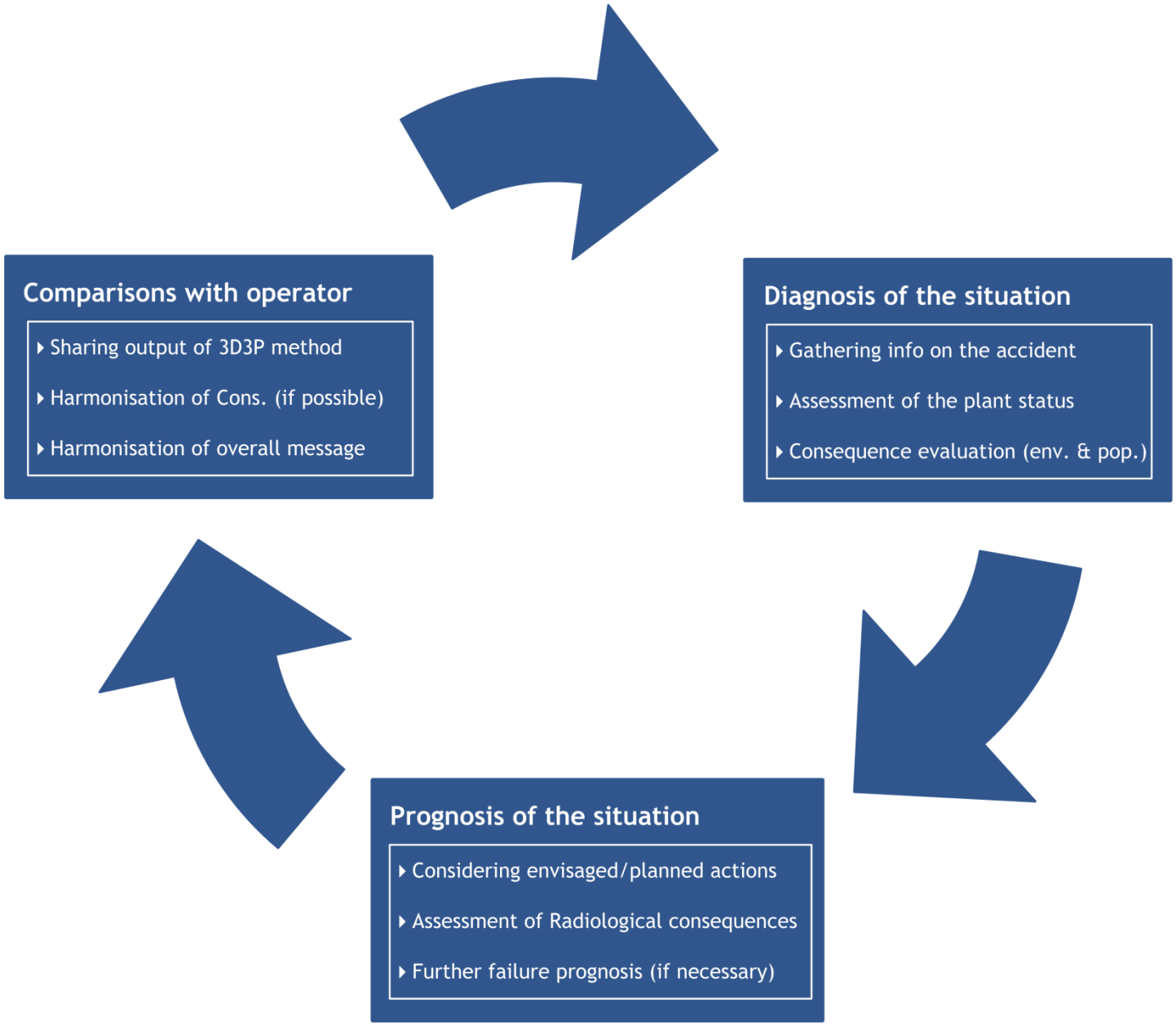
Procédure incidentelle ou accidentelle en cours (ou séquence) : ECP4 PAF conduite dure arrêt ISMP

Actions en cours, événements et actions survenus (par exemple : ouverture des soupapes du pressuriseur, isolement de l'enceinte, niveau bas PTR, ...) : Refroidissement à 56°C/h

Evénements et actions prévus : Suite à la coupure des batteries voie A → perte des rateaux voie A d'où perte d'information en SdC (enregistreurs, indicateurs KIT)

- **Technical data shall be exchanged but with common objectives in term of technical assessments (share emergency response objectives)**
- Common objectives for the expertise assessments (driver of the expertise)
- Put in place a common expertise methodology to conduct the assessments between the operator and public assets
- The common methodology shall separate the analysis of the current state of the accident installation (**Diagnosis**) and the possible development of the situation (**Prognosis**)
- In the expertise process, room shall be available to compare expertise results and visions to fulfill the response objectives

General assessment methodology to be shared



Make it simple

- Have some objectives to drive your evaluation
  - Protection of the public
  - Compare evaluations with measurements (containment)
- Have a methodology in place
  - France (IRSN & EdF) is using a comprehensive methodology to assess the D/P of the plant
- Software shall use a simple set of parameters
- Focus on the main phenomena
- …And be able to evaluate a source term and consequences in minutes!
- Evaluations shall be comparable with what is observed in the environment