FINAL TORC WORKSHOP

DEC 1ST, 2016

T.O. Grøtan, SINTEF Technology and Society, Norway

Financed by

- The Research Council of Norway
- Fondation pour une Culture de Sécurite Industrielle (FonCSI, France)
- Industry Partners (Strukton, Infraspeed, NAM, Eni Norge)

TORC
Training for Operational Resilience Capabilities

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- Eni Norge

TNO innovation for life

- Strukton Rail
- Infraspeed Maintenance BV
- Nederlandse Aardolie Maatschappij BV (NAM)

Dédale

- French ATM

- *Tor Olav Grøtan, Senior Scientist, TORC Coordinator*
- *tor.o.grotan@sintef.no*

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Outline
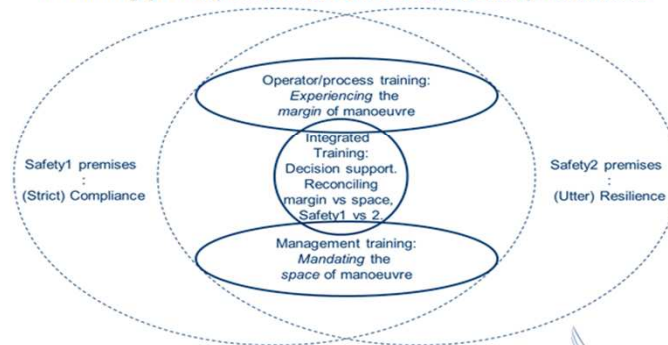
- **Celebration**!
  - Scope
  - History
  - Achievements

- Agenda of the day
  - Opening remarks: TNO
  - Keynote (to reflect our heritage from Resilience Engineering)
  - Resilience from the company perspective– why and what?
  - Resilience in the context of compliance; theory and implications of "resilience a la TORC"
  - Live demo of TORC game
  - Companies' experience with TORC/game.
  - How do we proceed to strengthen resilience?
  - Safety and beyond? How can TORC be utilized?
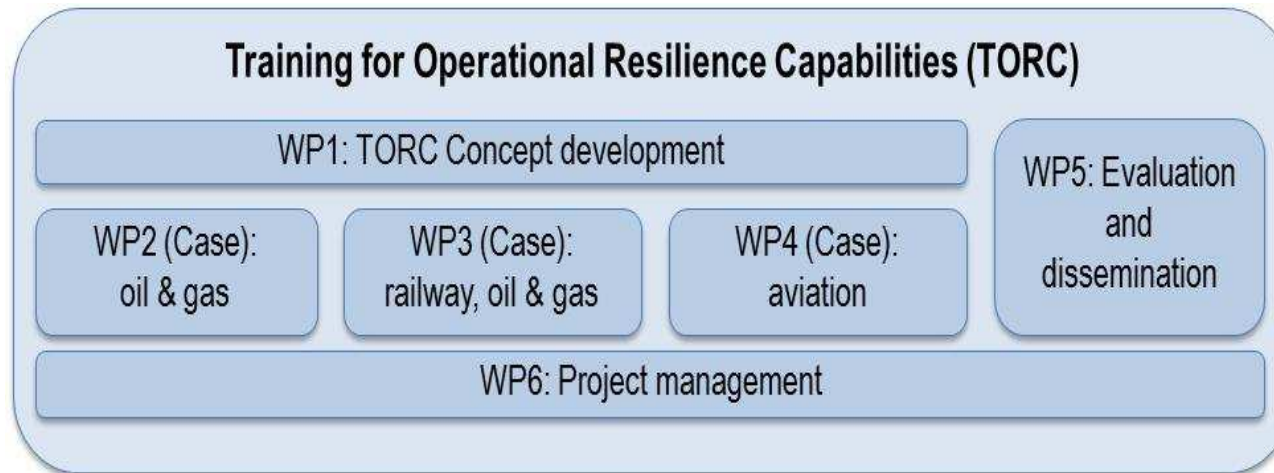 - Closure (16:00)

What we will learn

- how industrial companies in rail transportation, aviation and oil & gas industry receive and conceive the idea of resilience in their operational contexts

- the TORC approach to training based on the idea/theory of *resilience in the context of compliance*

- the TORC methods, tools and the TORC *gaming* approach

- the expectations and experiences of companies piloting the TORC approach

- the potentials and prospects for utilization and further development of the TORC approach

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TORC project structure 2014-16

Financed by the Research Council of Norway, Fondation pour une Culture de Sécurite Industrielle (FonCSI, France) and Industry Partners
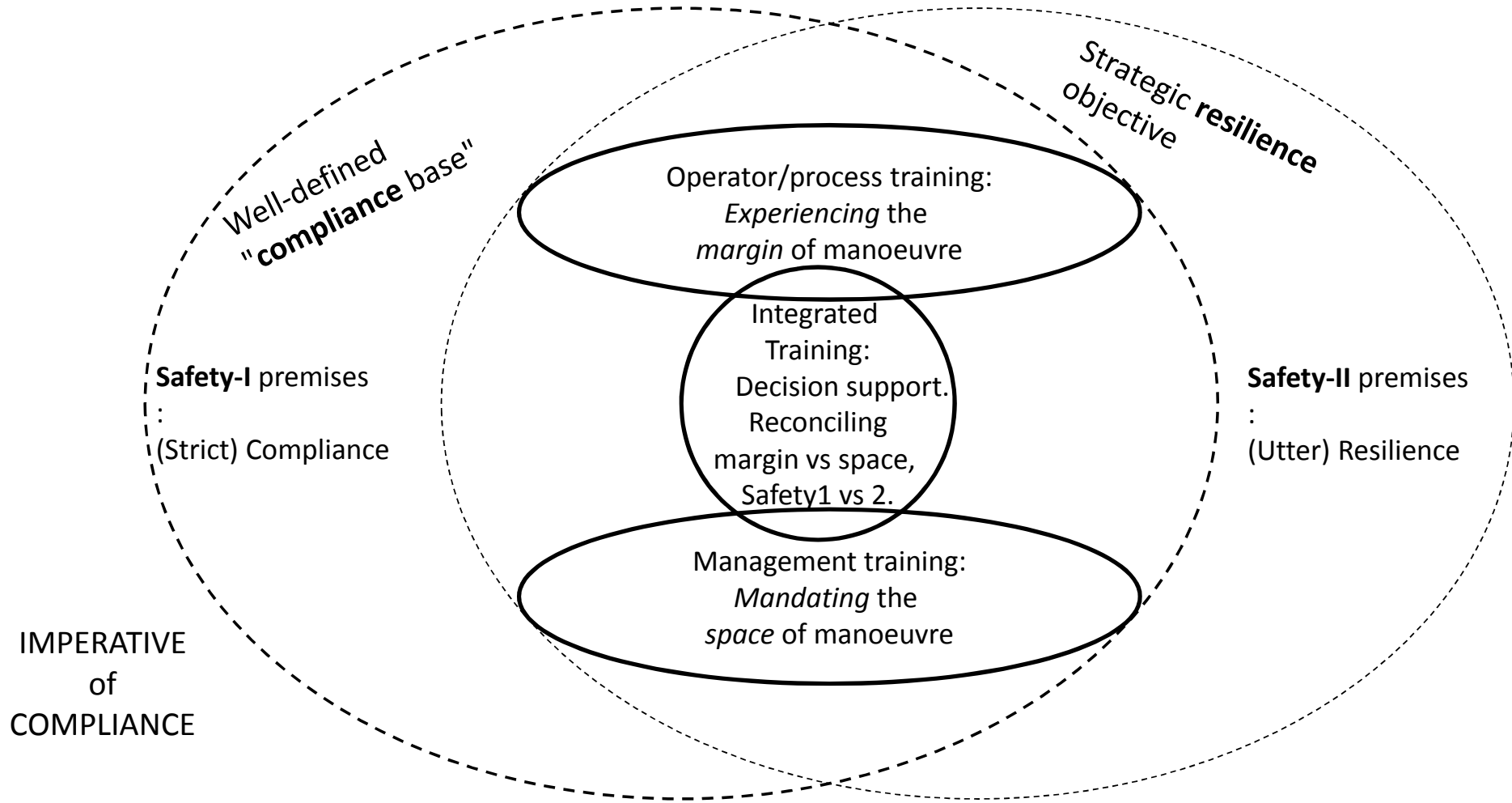

Training for Operational Resilience Capabilities (TORC)

WP1: TORC Concept development			WP5: Evaluation and dissemination
WP2 (Case): oil & gas	WP3 (Case): railway, oil & gas	WP4 (Case): aviation	
WP6: Project management			

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Point of departure: Distinctive but coherent training

Well-defined "**compliance** base"

Strategic **resilience** objective

Operator/process training: *Experiencing* the *margin* of manoeuvre

Integrated Training: Decision support. Reconciling margin vs space, Safety1 vs 2.

Management training: *Mandating* the *space* of manoeuvre

Safety-I premises : (Strict) Compliance

Safety-II premises : (Utter) Resilience

IMPERATIVE of COMPLIANCE

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Dutch Engineering;
crucial for things to move

Source: www.eninorge.com

Source: www.eninorge.com
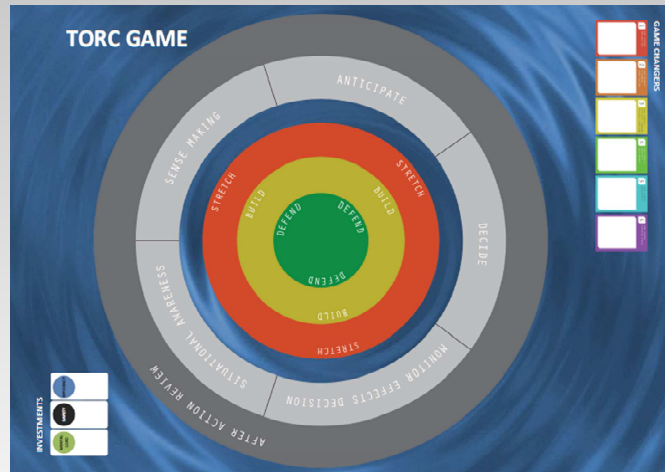
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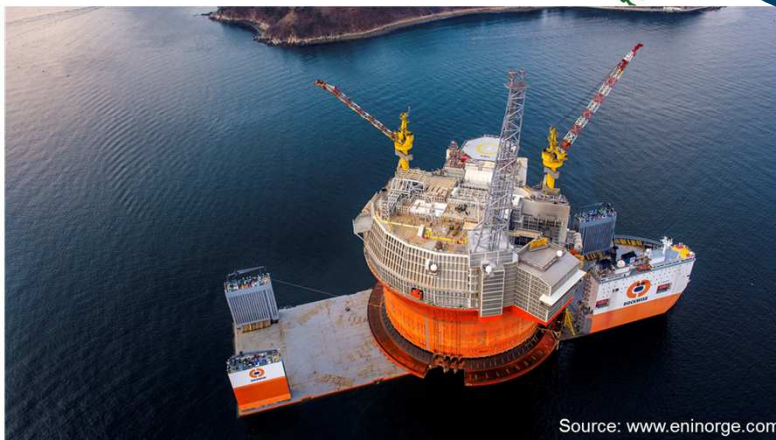
- The world's heaviest "dry cargo" ever; from Korea to N. Norway (2015)
- Is now producing oil outside Hammerfest (March 2016)

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.... including TORC *gaming*

- Strukton Rail
- Infraspeed Maintenance BV
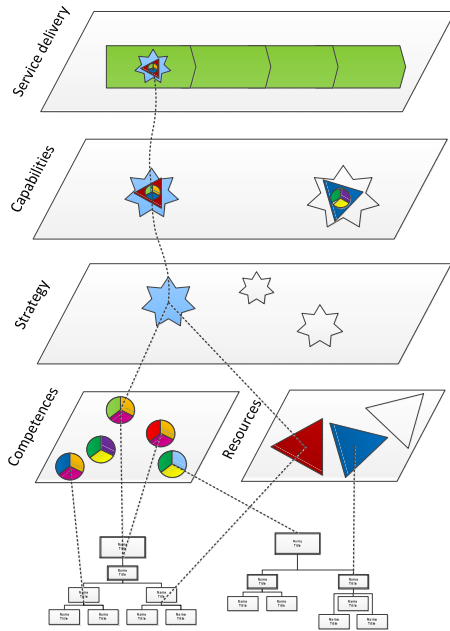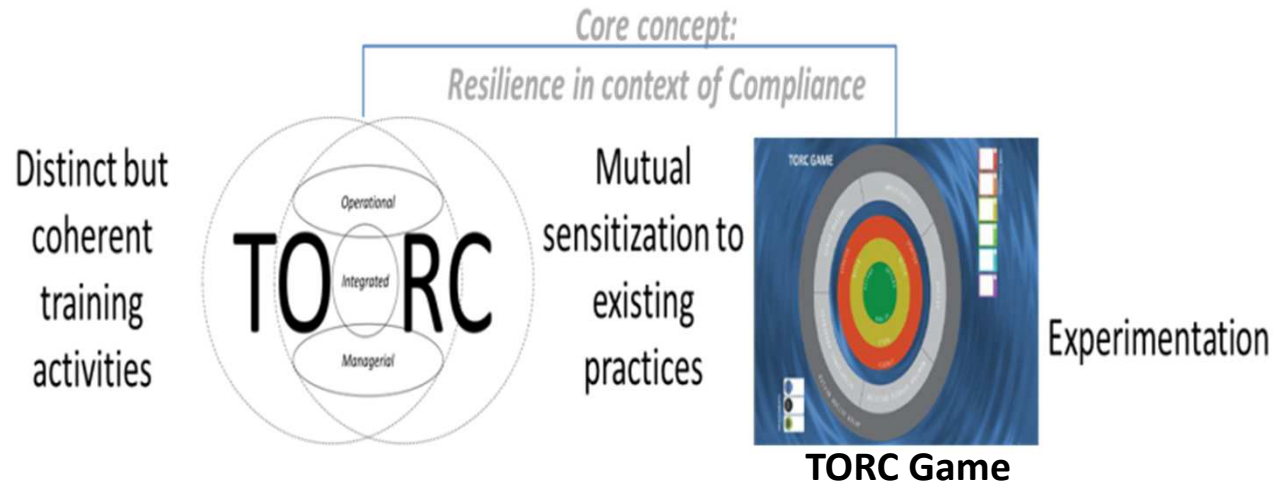- Nederlandse Aardolie Maatschappij BV (NAM)

- French ATM

- EniNorge

From rudimentary to "capabilitized" resilience through training/gaming

Core concept:
Resilience in context of Compliance

Distinct but coherent training activities

TO·RC
- Operational
- Integrated
- Managerial

Mutual sensitization to existing practices

Experimentation

TORC Game

Service delivery

Capabilities

Strategy

Competences / Resources

Organizational adaptation, prioritization and formalization

Rudiments → **RESILIENCE** → Capabilities

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Presumed application areas

- **Normal operation**

  - Procedures (SOP) constitute the compliance base

- Emergency training

  - Plans for "Defined Hazard and Accident Scenarios" (DHAS) constitutes the compliance base

- Unexpected situations

  - The compliance base must be "found" on the spot

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(Agenda)

- Opening remarks: TNO

- Keynote (We departed from Resilience Engineering, but arrived in a different context. Did we go (too) far?)

- Resilience from the company perspective– why and what?

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"Guilty pleasure": (TORC) Theory

Hunting high and low for resilience: Sensitization from the contextual shadows of compliance

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TO RULE, OR NOT TO RULE IS NOT THE QUESTION (FOR ORGANIZING CHANGE TOWARDS RESILIENCE IN AN INTEGRATED WORLD)

Tor Olav Grøtan[1,2]

Tor Olav Grøtan

Organizing, thinking and acting resiliently under the imperative of compliance

On the potential impact of resilience thinking on safety management and risk consideration
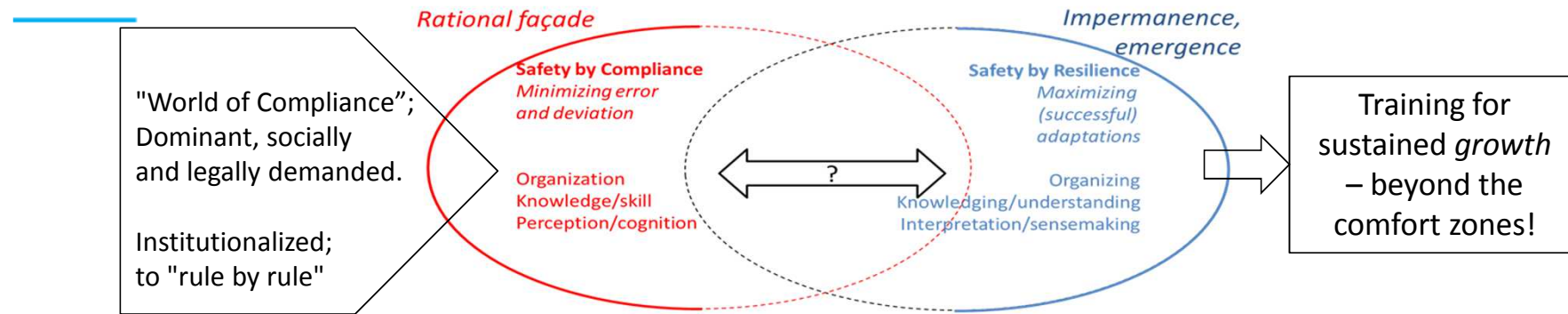
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Paradoxes of resilience as a concept

- A *situated practice* that cannot be expected to recur in the exact same way

- In/across organizations: dependent on the *creative* use of different strategies *collaboratively* applied by (multidisciplinary) teams in line with operational demands that can vary over time

- Benefits from *training* and rehearsal
  - Countering risk of adaptive failure: resilience is a fallible practice

- Descriptive or normative approach to the "resilient object"?
  - Bergström, J., van Winsen, R. & Henriqson, E. 2015. On the rationale of resilience in the domain of safety: A (*discursive*) literature review.

- Who is the "resilient subject"?
  - Functional approach/description renders residual risk on sharp-end (Bergström et al. 2015)
  - Managerial responsibility – hardly addressed
    - Support, accountability, liability, legitimacy; a defined space of maneuver?

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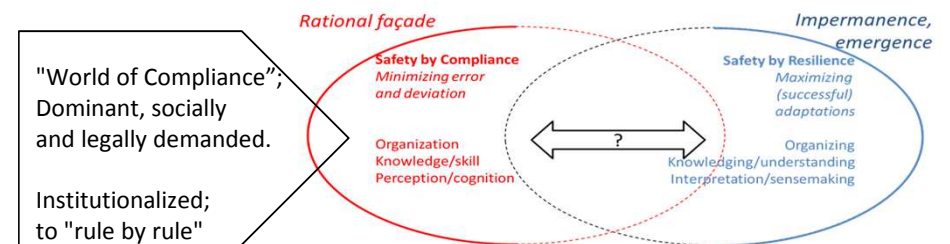# Behind the rational facade; Resilience under the imperative of compliance ("Safety II in context of Safety I")

Rational façade

Safety by Compliance
Minimizing error and deviation

Organization
Knowledge/skill
Perception/cognition

?

Impermanence, emergence

Safety by Resilience
Maximizing (successful) adaptations

Organizing
Knowledging/understanding
Interpretation/sensemaking

"World of Compliance"; Dominant, socially and legally demanded.

Institutionalized; to "rule by rule"

Training for sustained *growth* – beyond the comfort zones!

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- Resilience must unfold in the context of a compliance regime, enforced by management systems that are *external even to local management preference*

- Resilience training must be conducted and orchestrated with a defined relation to existing compliance-oriented training, aiming for a delicate balance

- Managerial attention may shift attention to alternative modes of control in terms of articulating a *space of maneuver* to field staff

- The appreciation of "rudimentary" resilience, and the need to strengthen it, may be accentuated and made explicit by simulation or by reflection on action.
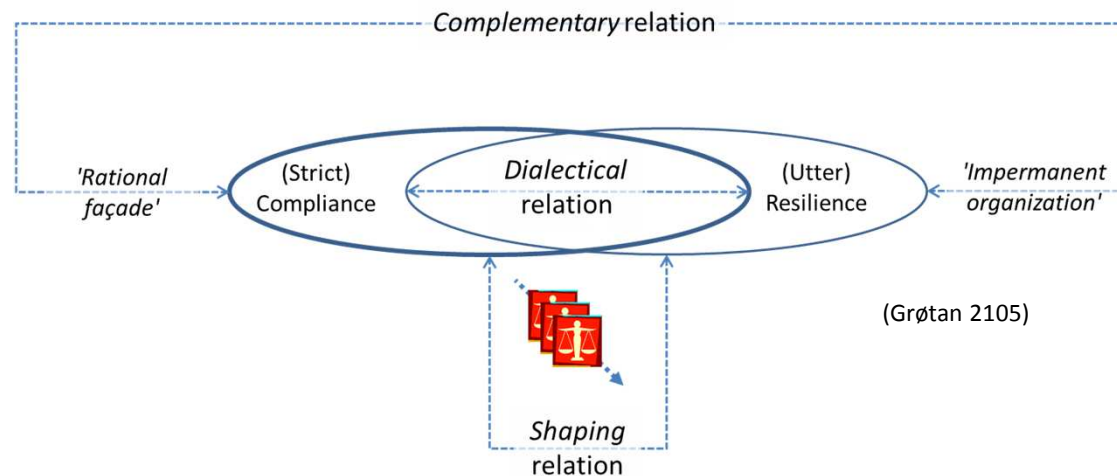
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(TORC) Pragmatics of resilient subjects

- Resilience Training must be recognized in/from pragmatic contexts

- A double-hermeneutic approach (A. Giddens) foundation is needed
  - Aim to understand *understanding subjects* rather than explaining *objects*

- Distinct pragmatics must be recognized, engaged an supported for collaboration
  - Operational pragmatics
  - Managerial pragmatics
  - Integrated (continual reconciliation)

- Resilience in the context of compliance
  - Resilience does not unfold in a contextual void, but in the context of its opposite orientation
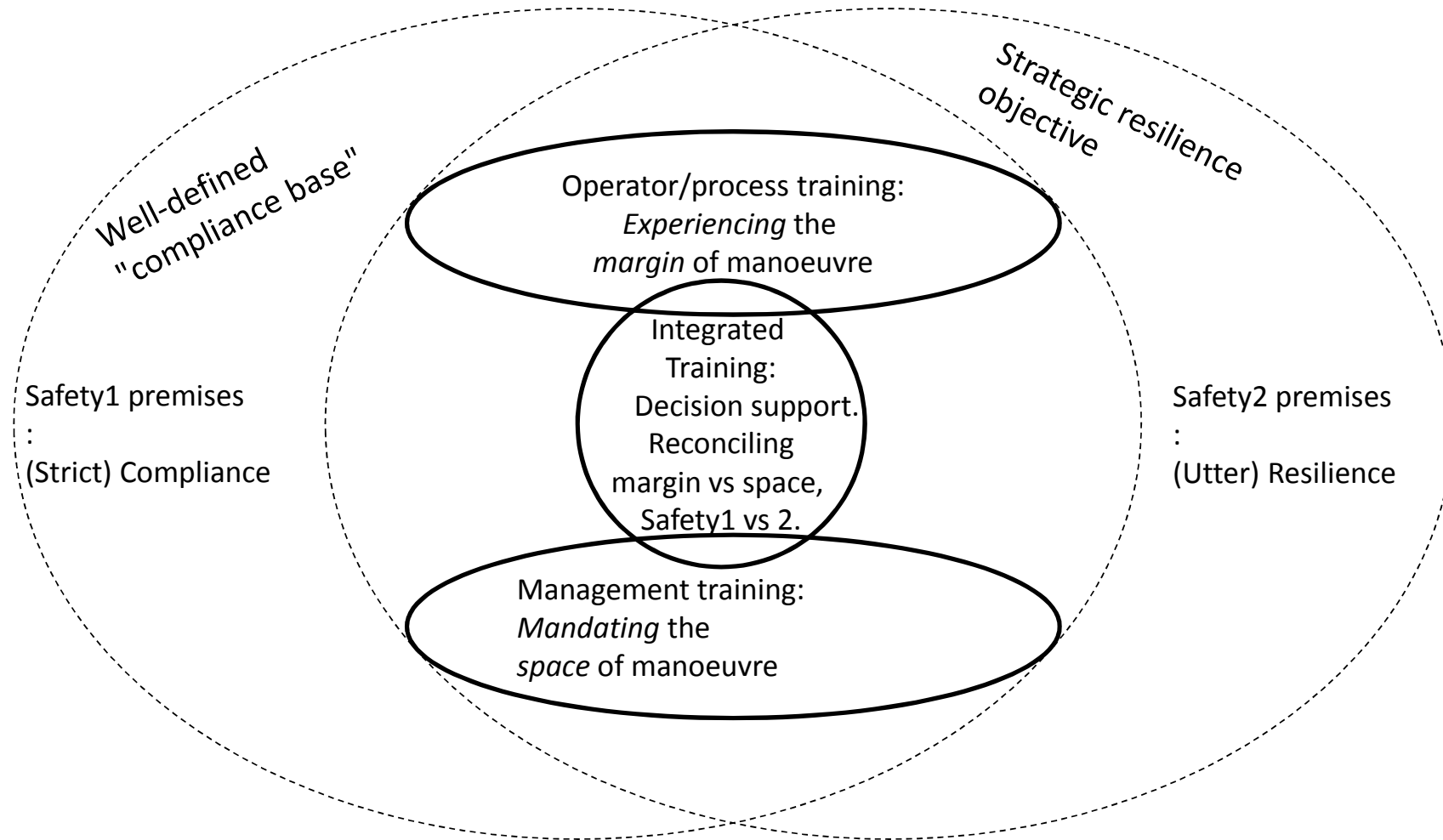
"World of Compliance"; Dominant, socially and legally demanded.

Institutionalized; to "rule by rule"

Rational façade

Safety by Compliance
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Organizing Knowledging/understanding Interpretation/sensemaking

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# Extended focus: "CvR" reconciliations

(Grøtan 2105)

- TORC training as a vehicle for a productive co-creation of functional and effective rules and trustworthy and reliable adaptive capacities, in conjunction.

- CvR reconciliation thus also implies an act of finding mutually measured CvR calibrations; aiming for increased resilience; complementing optimization of rules

- The "rational facade" tend to rest on a machine metaphor (Morgan, 2006) for the stable and enduring organization

- The resilient contribution rests on a more organic and adaptive organizational metaphoric17

  - ultimately pointing towards "organized impermanence" as described by Weick (2009).

TORC design: Distinctive but coherent training

Well-defined "compliance base"

Strategic resilience objective

Operator/process training: *Experiencing* the *margin* of manoeuvre

Integrated Training: Decision support. Reconciling margin vs space, Safety1 vs 2.

Management training: *Mandating* the *space* of manoeuvre

Safety1 premises : (Strict) Compliance

Safety2 premises : (Utter) Resilience

Aspiration and calibration

- Progressive aspiration levels *for resilient functioning* (inspired by Longstaff et al. 2013, Woods 2015)

  - R1. Defend normalcy (preferred mode of operation)

  - R2. Build robustness to anticipated disturbance

  - R3. Stretch and rebound in an (isolated) surprising/unexpected situation/episode

  - R4. Sustain resilient (R3) functioning over time

- Operational *margin* and managerial *space* must be (vertically) aligned, "as far as possible"

  - Two extreme "pathologies" can be envisaged through WAI vs WAD in the TORC space

- The actual balance point is not a normative issue, but a local, situated issue

  - External expectations, accountabilities and mandates

  - Inherent dynamics of system, actual capability of staff

  - Adaptive history, precarious present, resilient future
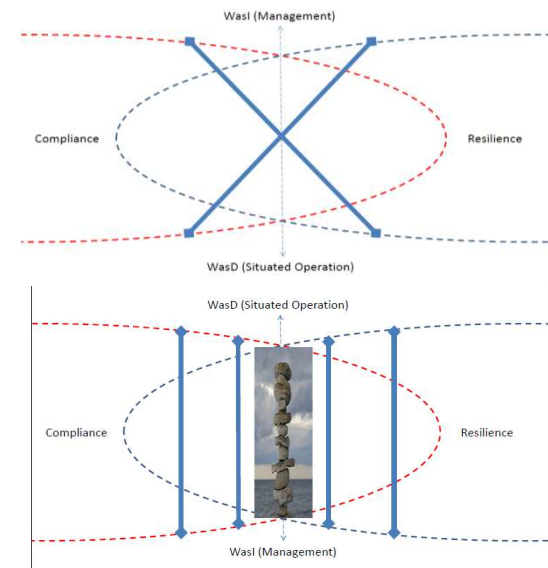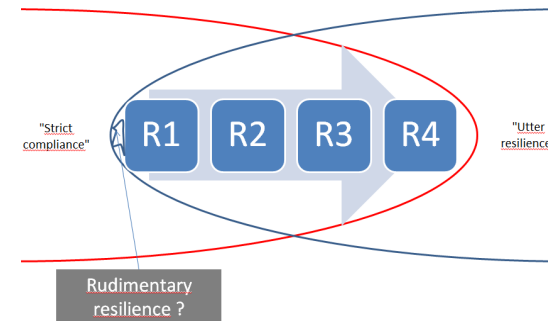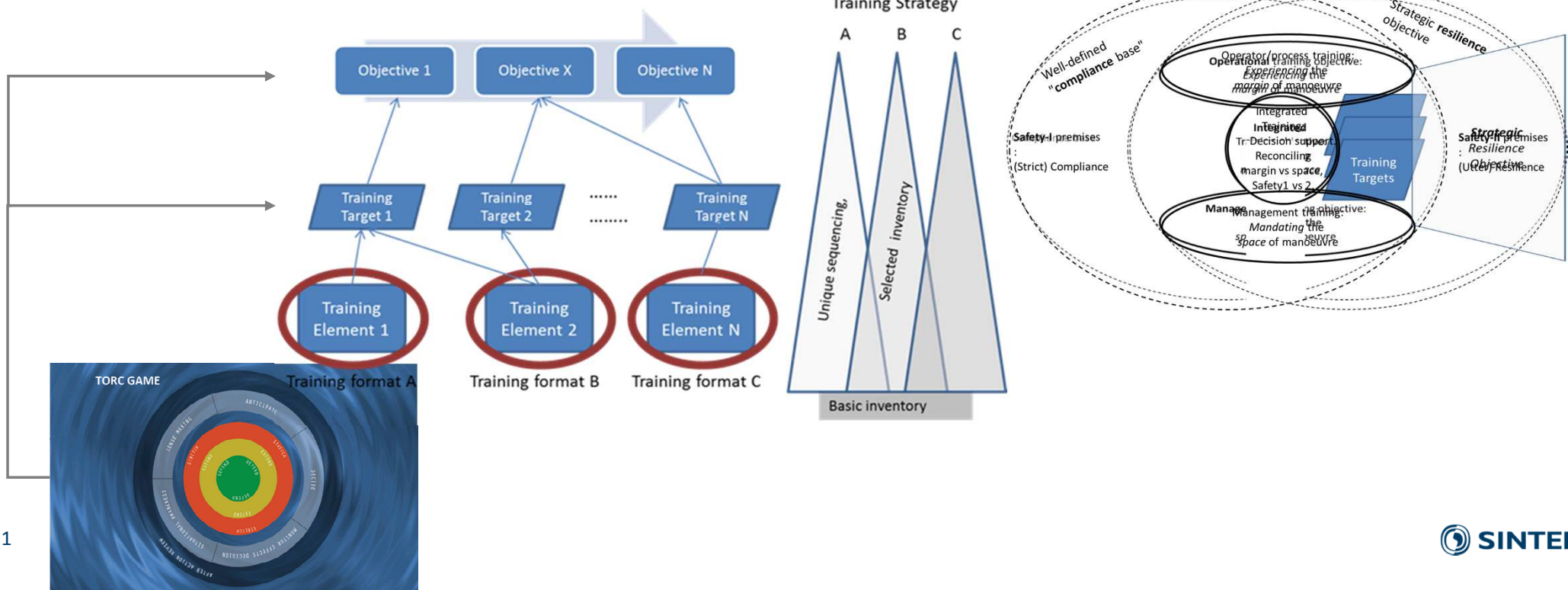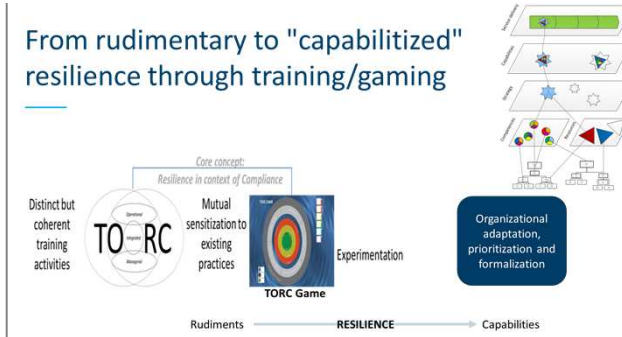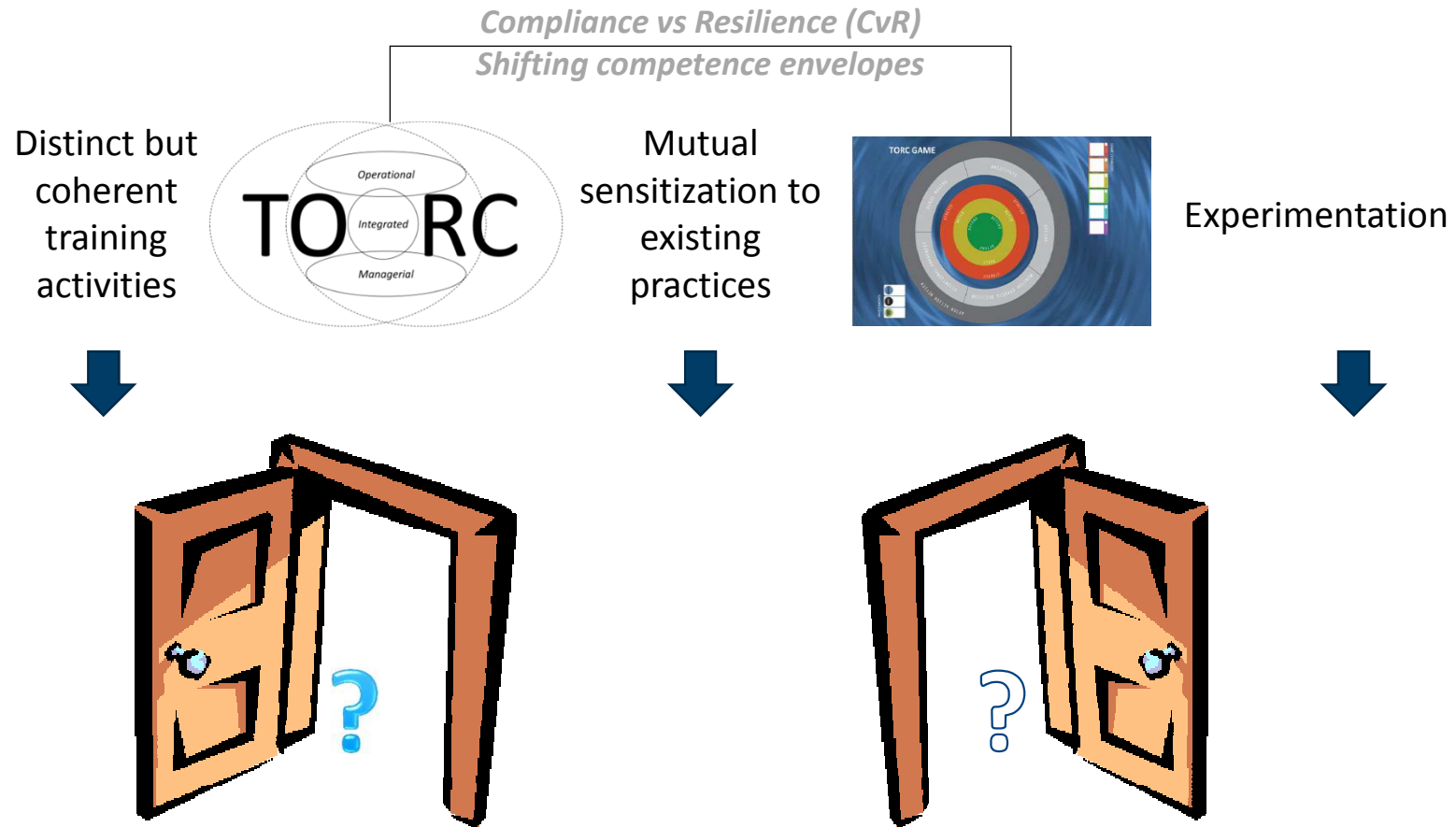
Aspiration levels and underlying modalities
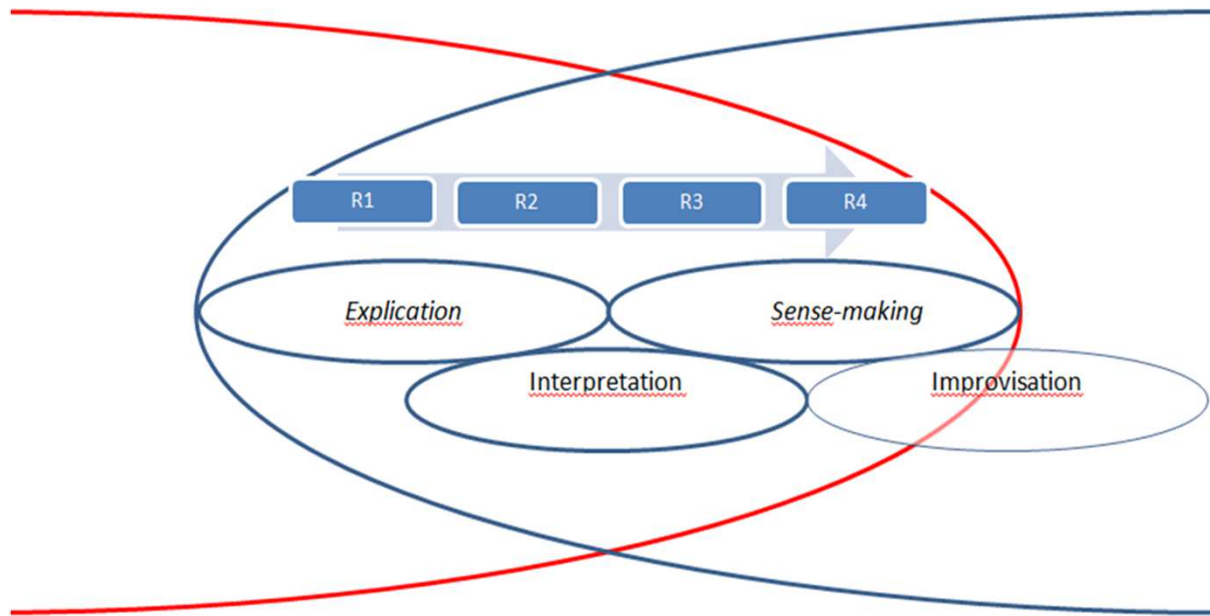
Top-down or bottom-up approach?

From rudimentary to "capabilitized" resilience through training/gaming

"Sensitization device": margin vs space to maneuver
Opening doors to new arenas & issues!

Compliance vs Resilience (CvR)
Shifting competence envelopes

Distinct but coherent training activities

Mutual sensitization to existing practices

Experimentation

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Deepening the impact of TORC *sensitization to maneuverability*: two prospects
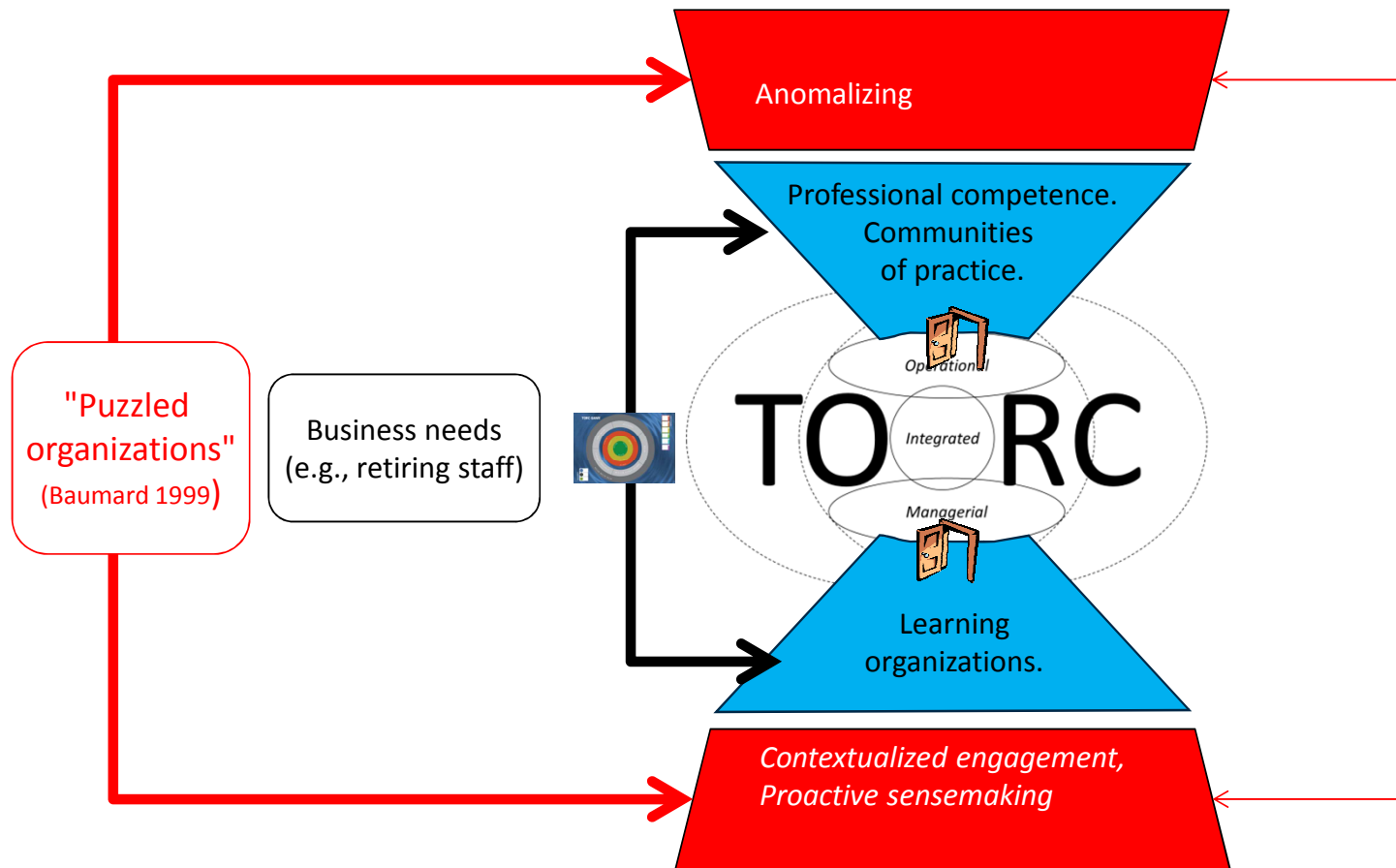
Anomalizing

Professional competence. Communities of practice.

Operational

Integrated

Managerial

TO RC

"Puzzled organizations" (Baumard 1999)

Business needs (e.g., retiring staff)

Learning organizations.

Contextualized engagement, Proactive sensemaking

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Presumed application areas

- Normal operation

  - Procedures (SOP) constitute the compliance base

- **Emergency training / resilience management**

  - "DHAS" constitutes the compliance base

    - E.g., (H2020) DARWIN. Resilience Management Guidelines. *"Expect the unexpected and know how to respond"*

- **Unexpected situations**

  - The compliance base must be "found" on the spot

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Technology for a better society