

Delivering Excellence Through
Innovation & Technology



철도시스템 국내/외 RAMS 활동 사례

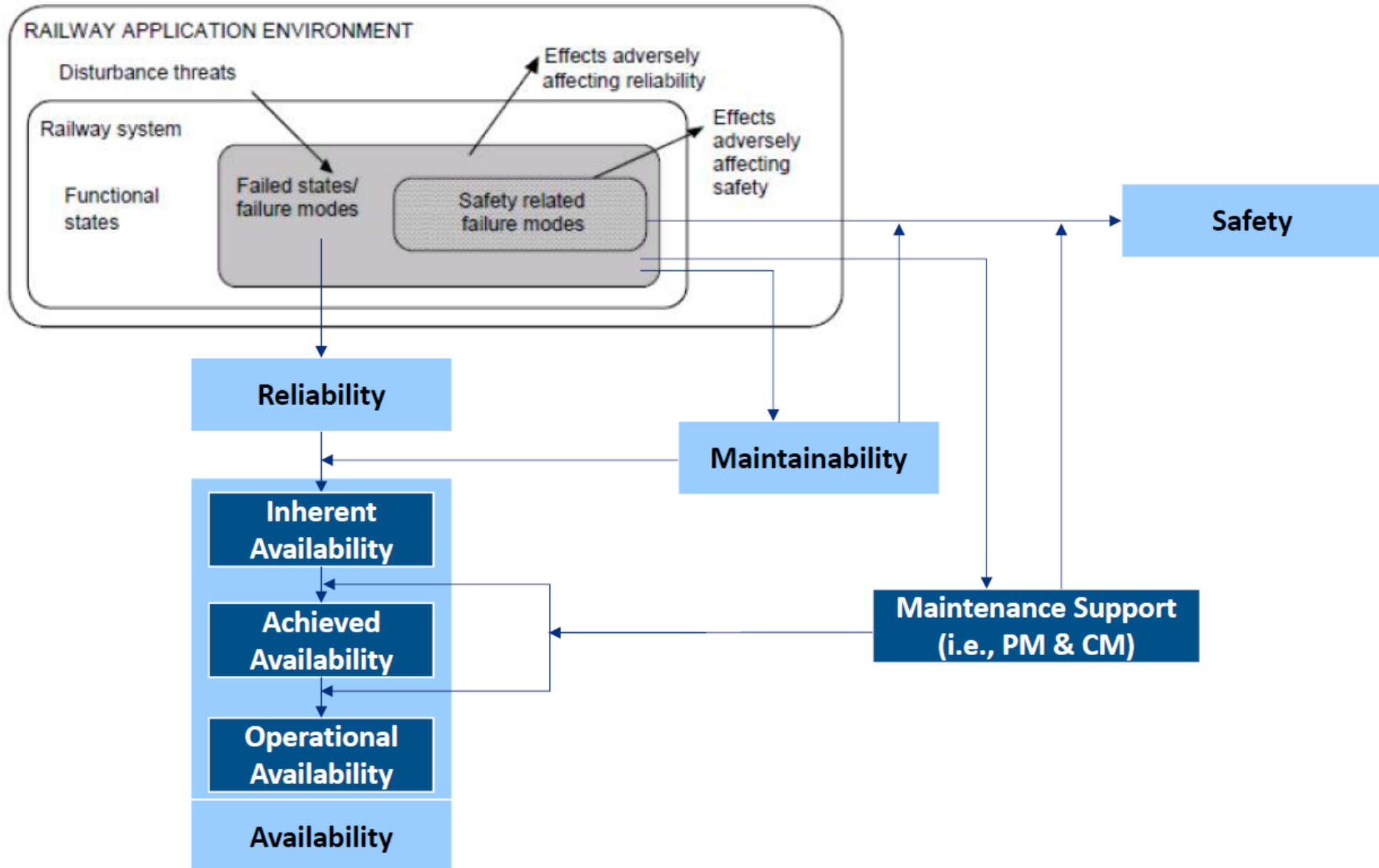
백영구
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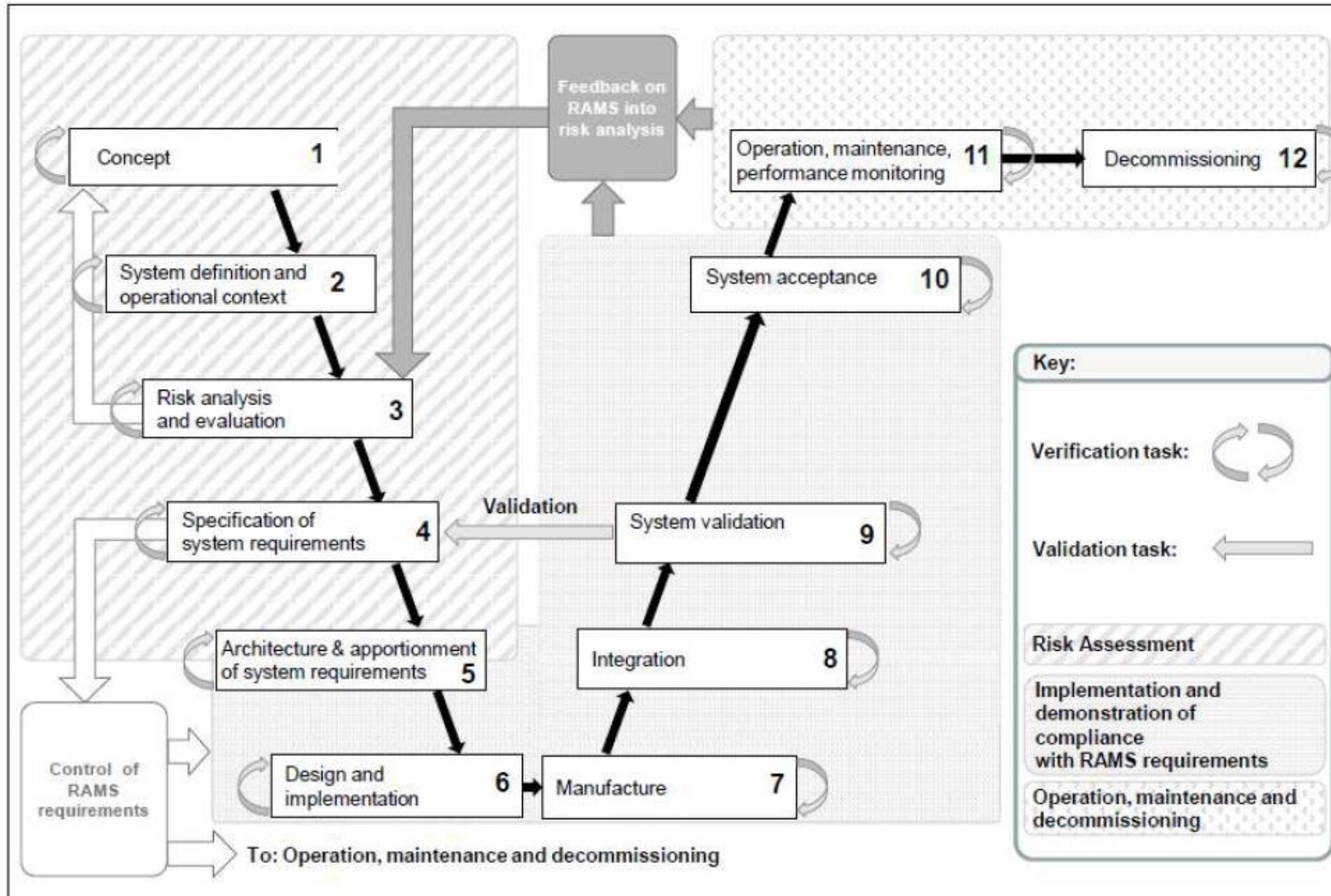
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RAMS 요소들 간의 상호관계(Inter-relationship of RAMS elements)



철도 RAMS 수행을 위한 수명주기 모델(V-cycle)



수명주기 단계별 주요 활동

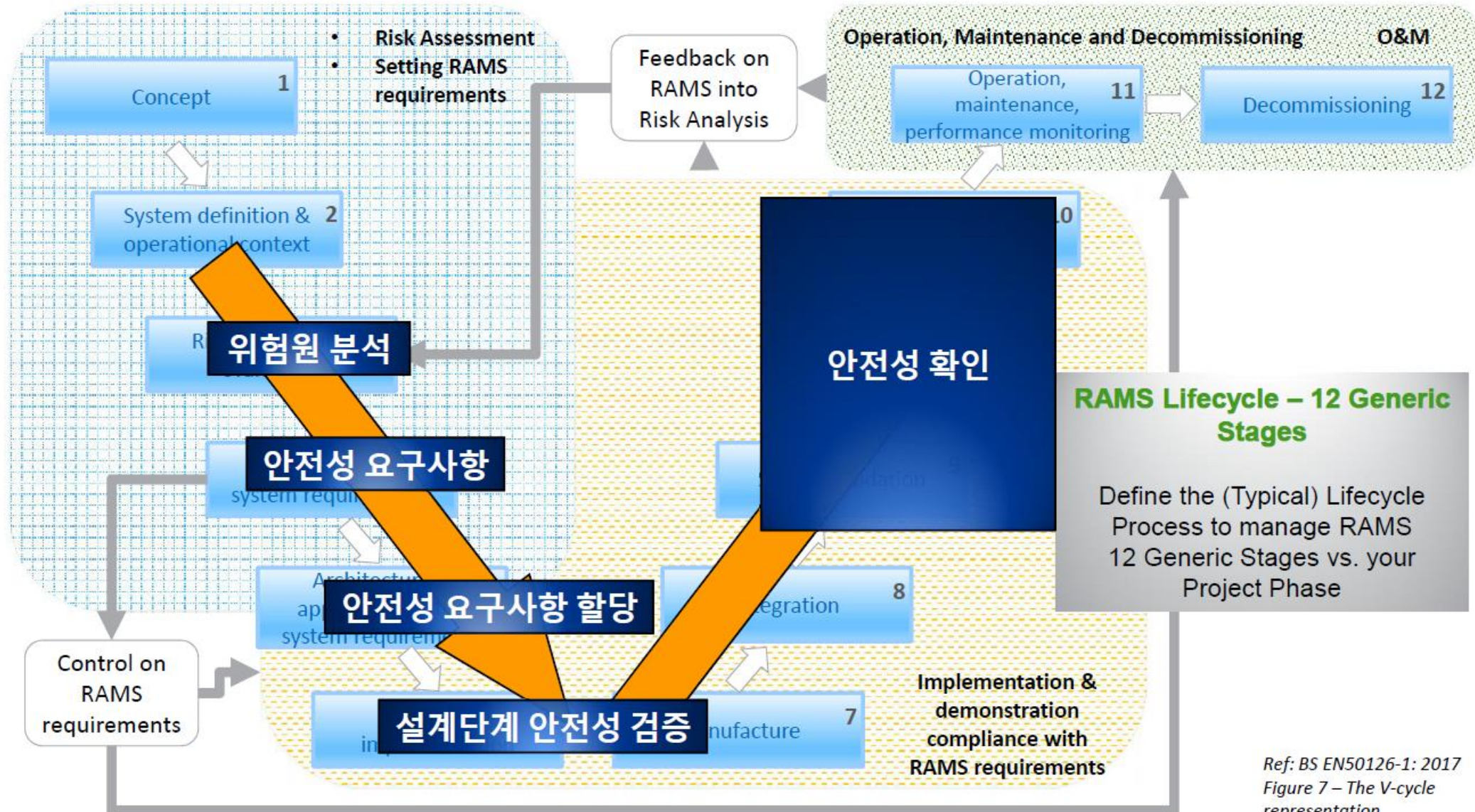


Phase	Phase	Clause	General tasks	RAM tasks	Safety tasks
1	Concept	7.2	<p>Investigate scope, context and purpose of the system.</p> <p>Investigate the environment of the system.</p>	<p>Investigate the general RAM implications of the system.</p> <p>Investigate previous RAM requirements and past RAM performance of similar/related systems.</p> <p>Investigate current RAM policy and targets of the relevant railway duty holders.</p> <p>Define the scope of the RAM management requirements for subsequent system life cycle RAM tasks.</p>	<p>Investigate the general safety implications of the system.</p> <p>Investigate previous safety requirements and past safety performance of similar/related systems.</p> <p>Investigate current safety policy and targets of the relevant railway duty holders.</p> <p>Investigate safety legislation.</p> <p>Define the scope of the safety management requirements for subsequent system life cycle safety tasks.</p>
2	System definition and operational context	7.3	<p>Define the system and its mission profile.</p> <p>Define the system boundary.</p> <p>Define the scope of operational requirements.</p> <p>Establish the organisation.</p>	<p>Establish the RAM policy.</p> <p>Establish the RAM plan.</p>	<p>Establish the safety policy.</p> <p>Establish the safety plan.</p>
3	Risk analysis and evaluation	7.4		<p>Perform Risk Analysis.</p> <p>Update RAM Plan.</p>	<p>Perform risk analysis.</p> <p>Establish hazard log.</p> <p>Update Safety Plan.</p> <p>Establish Independent Safety Assessment Plan</p>

- Safety Targeting
- Safety Planning (Programming)
- Safety Analysis (Inc. safety requirement allocation)
- Safety Verification and Validation



RAMS 수명주기 & 주요 안전성 활동



Ref: BS EN50126-1: 2017
Figure 7 – The V-cycle representation

Think about

- **Requirements** are complete and clear?
- **Design** and **Development** has been doing in right way?
- **Test** has been **planned** properly and doing in a **rigorous way**?
- Supporting **evidence** is enough?

- Who has to assure the SYSTEM?
 - Railway duty holder (e.g. Asset Owner, Operator and Maintainer)
 - Railway suppliers
 - Assessment bodies (e.g. ISA (Independent Safety Assessment))

계층적 시스템 분류 및 V&V 접근방안

