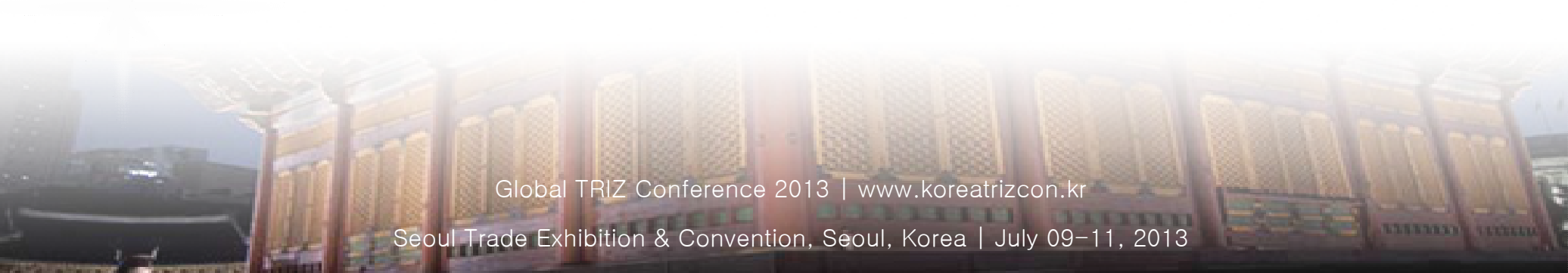




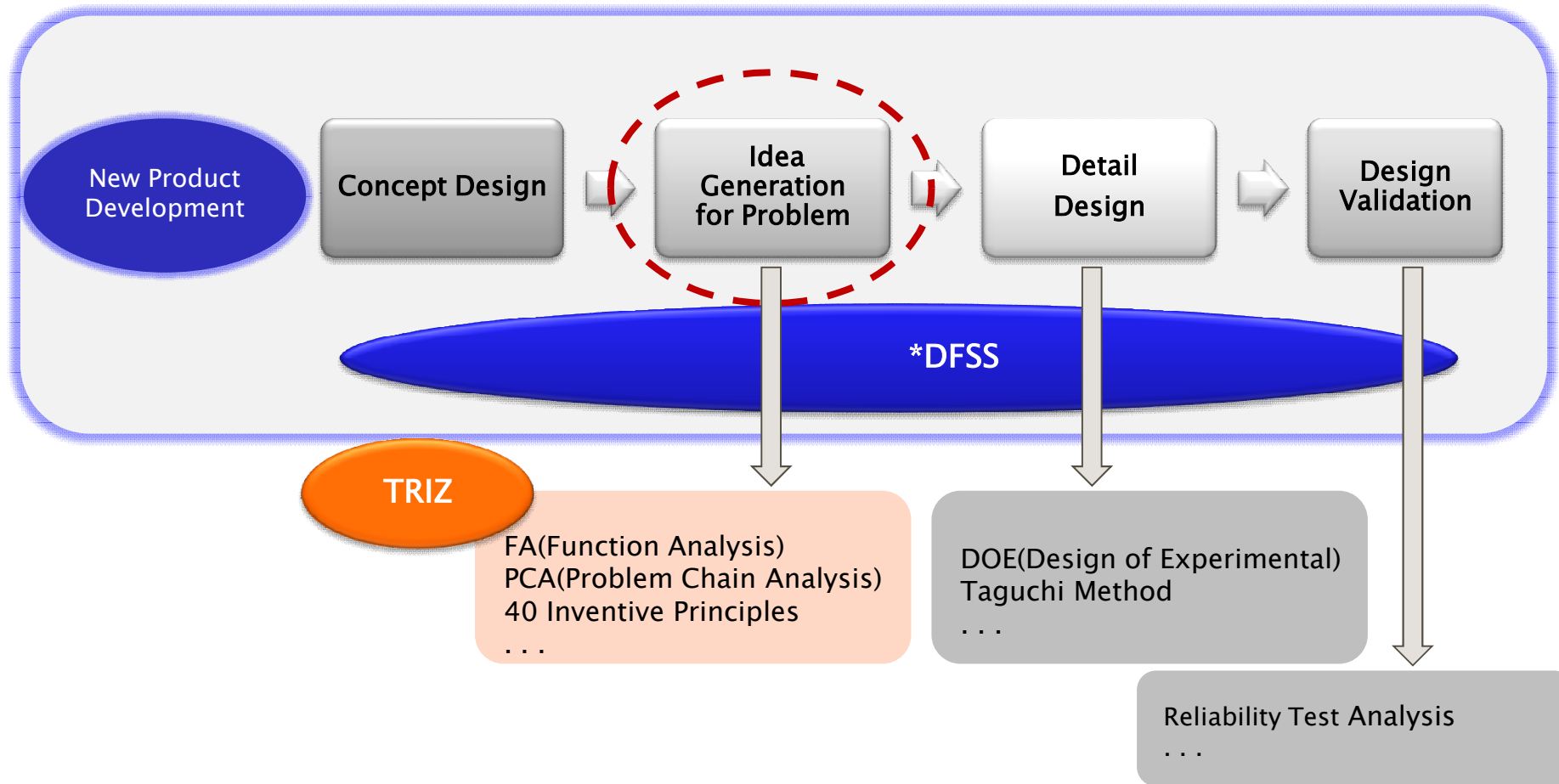
# The Practitioners' Contribution of Problem Mode Analysis

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Mando, [dsyoon@mando.com](mailto:dsyoon@mando.com)

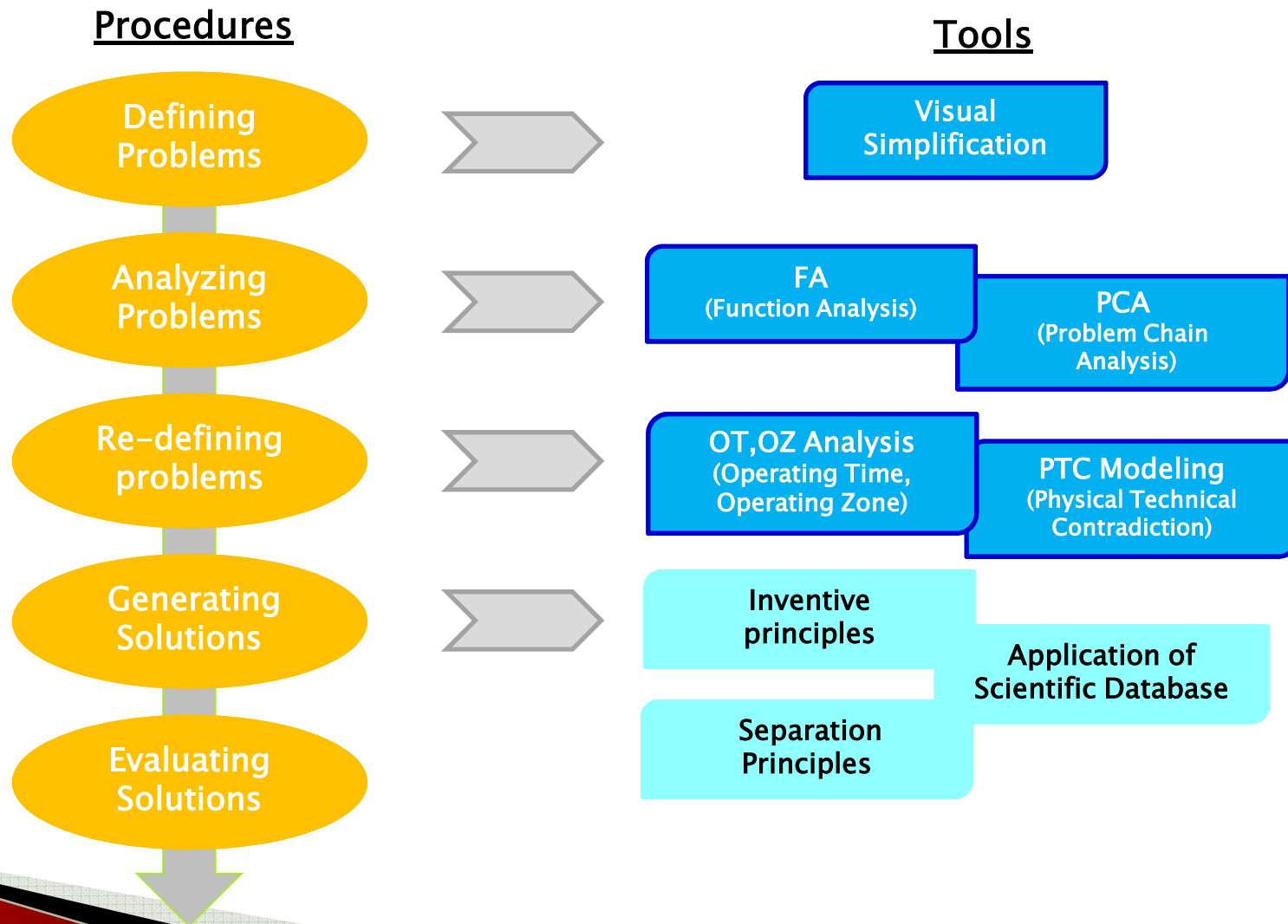


Global TRIZ Conference 2013 | [www.koreatrizcon.kr](http://www.koreatrizcon.kr)  
Seoul Trade Exhibition & Convention, Seoul, Korea | July 09–11, 2013

# 1. TRIZ on the New Product Development

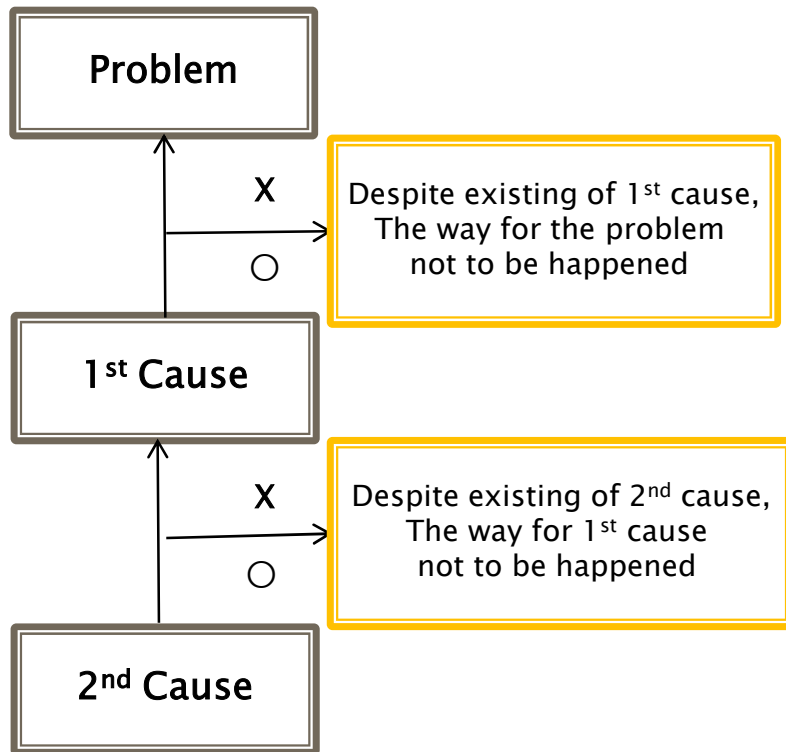


## 2. TRIZ Procedures of MANDO

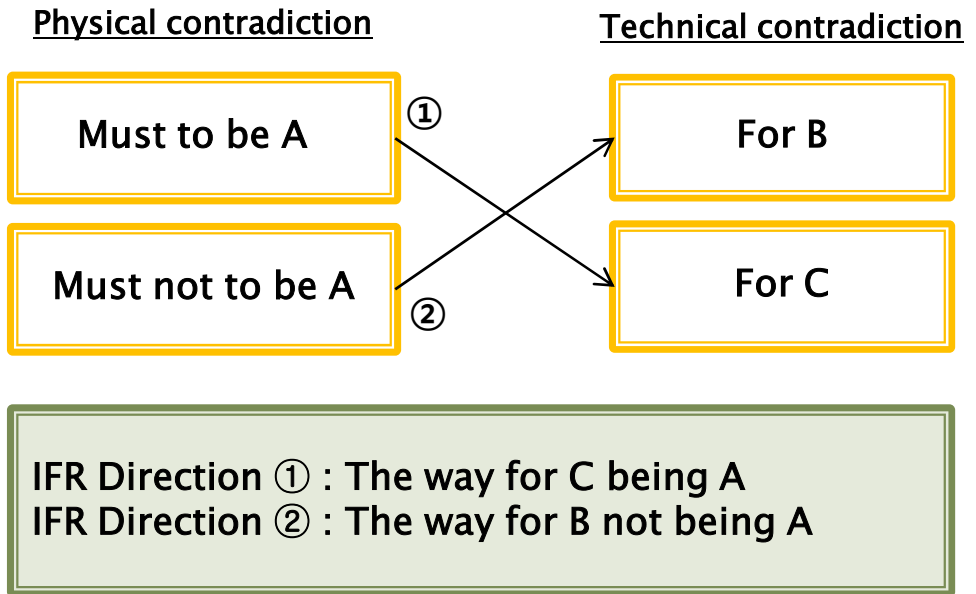


# 3. Problem Analysis Tools

## 1. PCA(Problem Chain Analysis)



## 2. PTC Modeling(Physical Technical Contradiction)



## 4. Analysis Method of Problem Mode

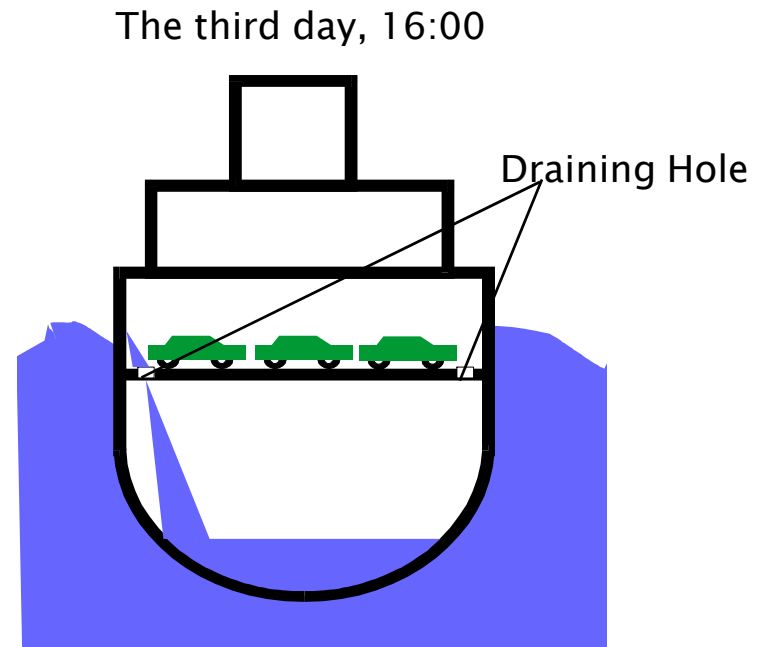
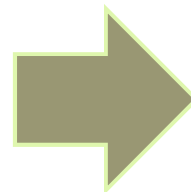
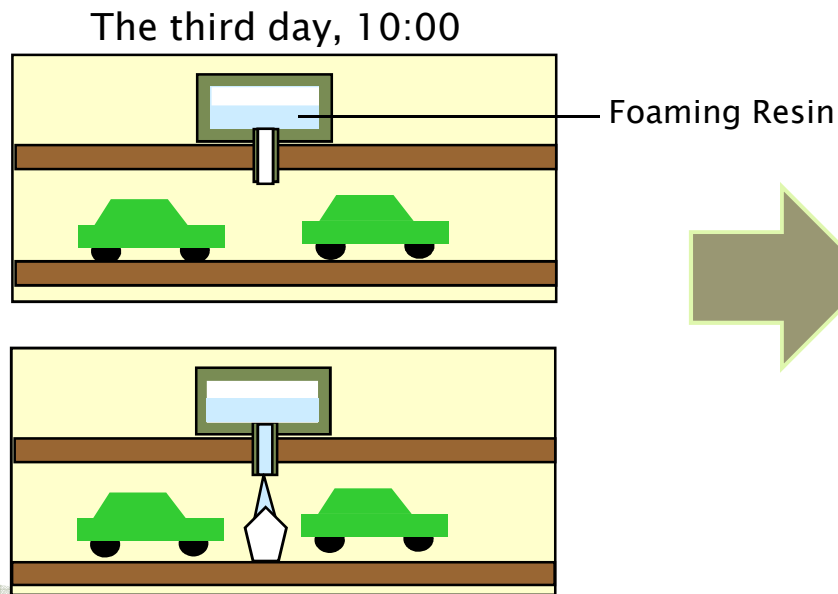
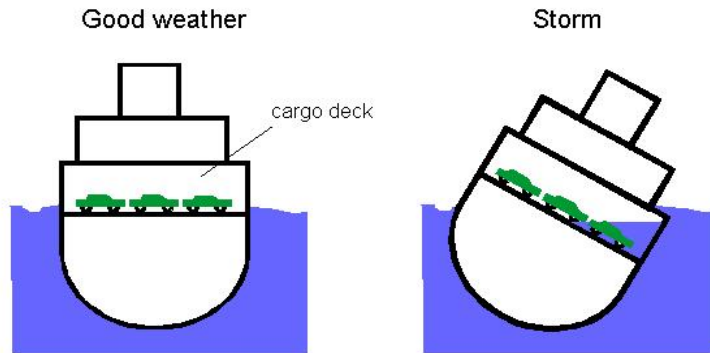
### ■ Motivation

Why does TRIZ consider the contradiction to be important? Couldn't we solve the problem without a contradiction? Would we find the ideal resolution faster, if we acknowledge a problem mode? **This study explains the method which we analyze the problem rationally and then suggest the suitable resolution.**

Problem Mode		Analysis Method	Constraint Factor
Problem <u>without</u> Contradiction		<p><b>PCA</b></p> <ul style="list-style-type: none"> <li>- Analyze the Causes by PCA</li> <li>- <b>Concentrate on Various Causes</b></li> <li>- Find the Ideal Resolution by PCA</li> </ul>	<b>Fixed Idea</b>
Problem with Contradiction	Technical Contradiction <u>not</u> revealed	<p><b>PCA ↔ PTC</b></p> <p>Analyze the Causes by PCA</p> <ul style="list-style-type: none"> <li>- Deploy the Contradiction by PTC Modeling</li> <li>- <b>Find the Ideal Resolution by PCA &amp; PTC Modeling</b></li> </ul>	<b>Contradiction</b>
	Technical Contradiction revealed		

# 4-1. Problem without contradiction

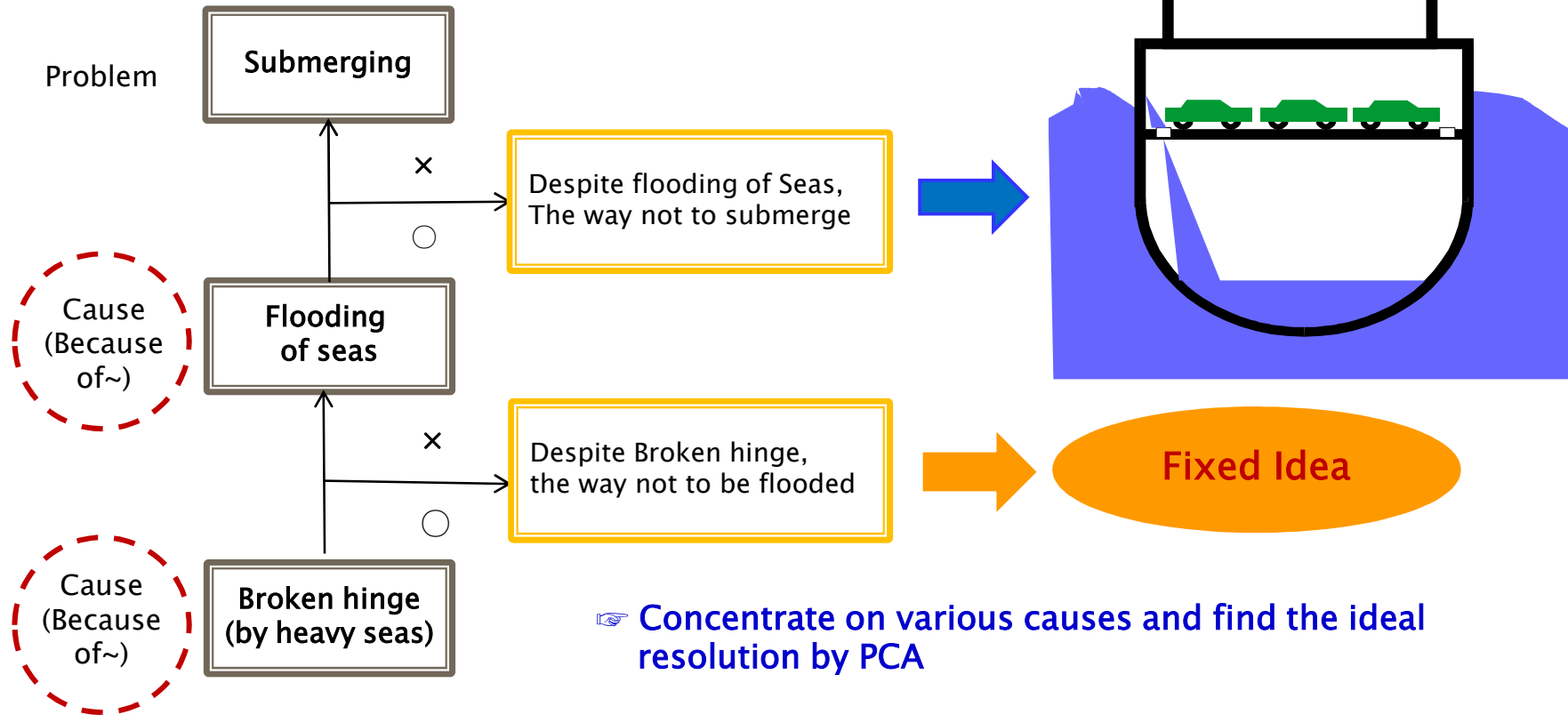
## ■ Case : Submerging ship



Operating Zone,  
Harmful resource,  
Applied 22 among 40 Inventive Principles

# 4-1. Problem without contradiction

## ■ Analysis Method



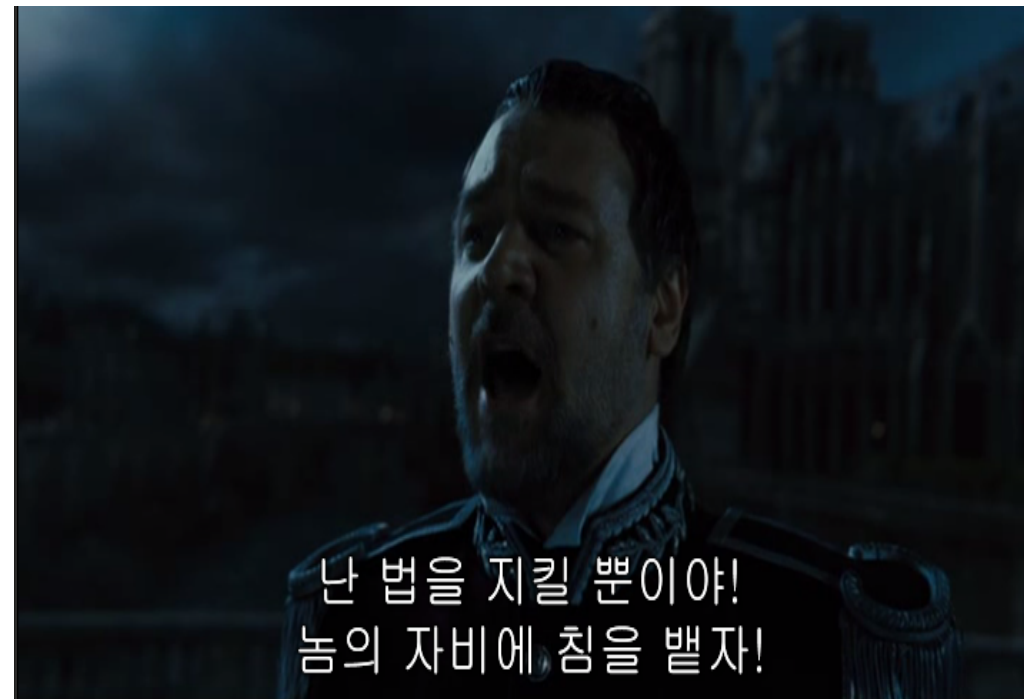
☞ Concentrate on various causes and find the ideal resolution by PCA

Ex. Make the drain hole on the board of ship.

Set up the equipments for pumping out.

## 4-2. Problem with contradiction (1)

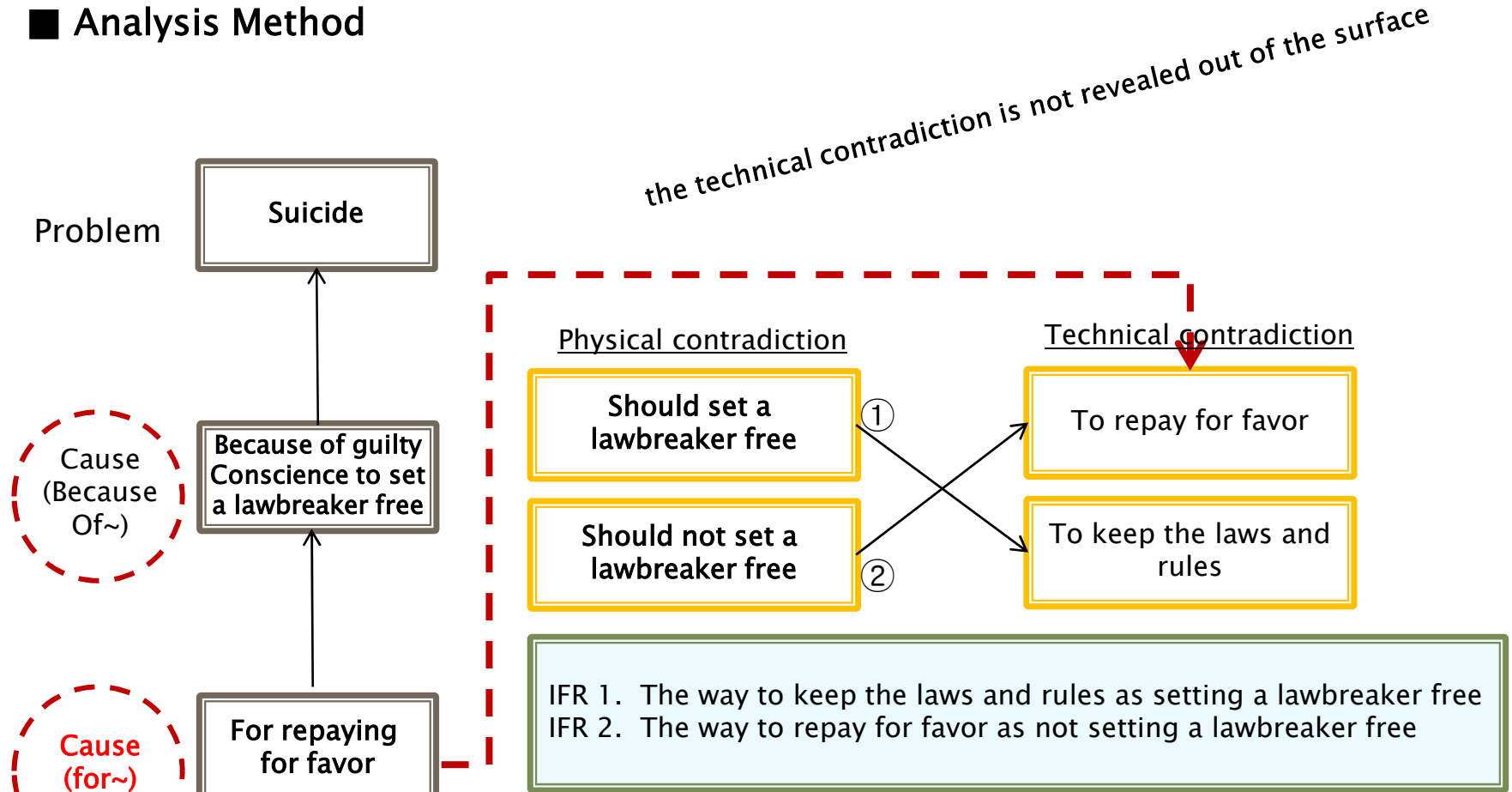
- Case : Inspector JAVERT's Dilemma (in the movie "Les Miserables")





# 4-2. Problem with contradiction (1)

## ■ Analysis Method

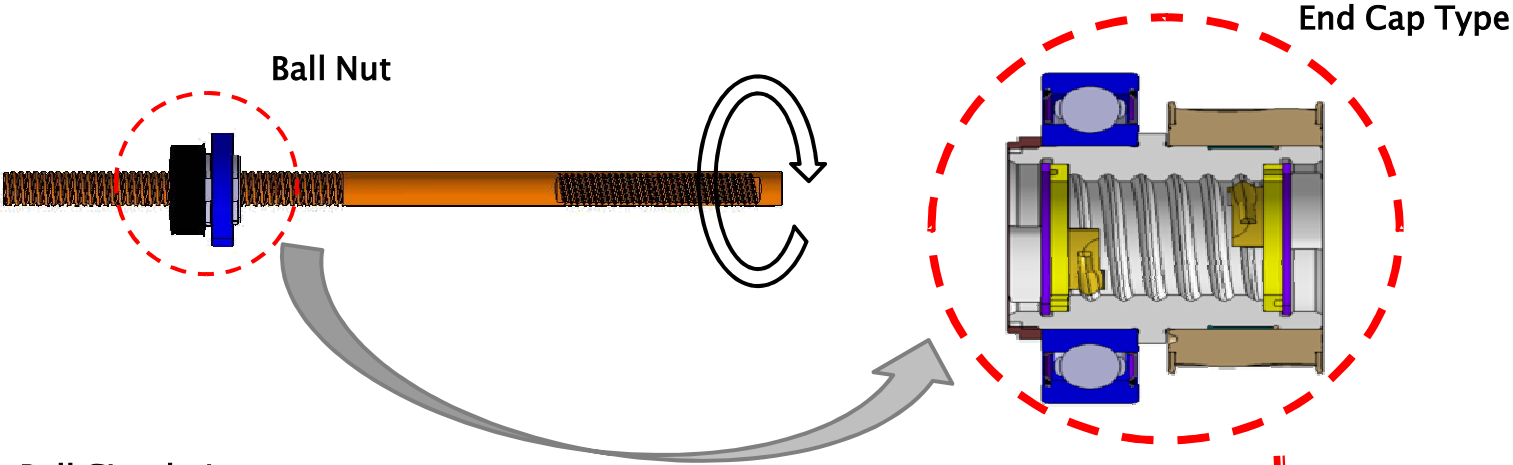


👉 Find the ideal resolution by PCA & PTC Modeling

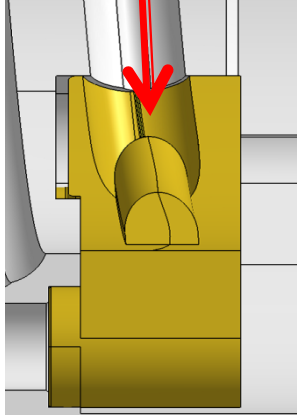
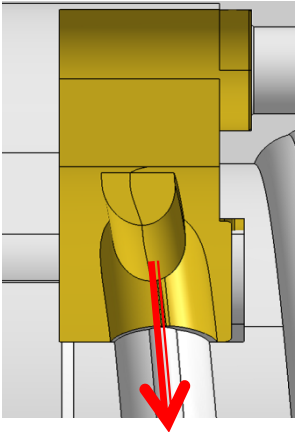
Ex. Set a lawbreaker free first and then apply the laws and rules later (separation of the time)

# 4-3. Problem with contradiction (2)

## Case : Friction Excess of Ball Nut



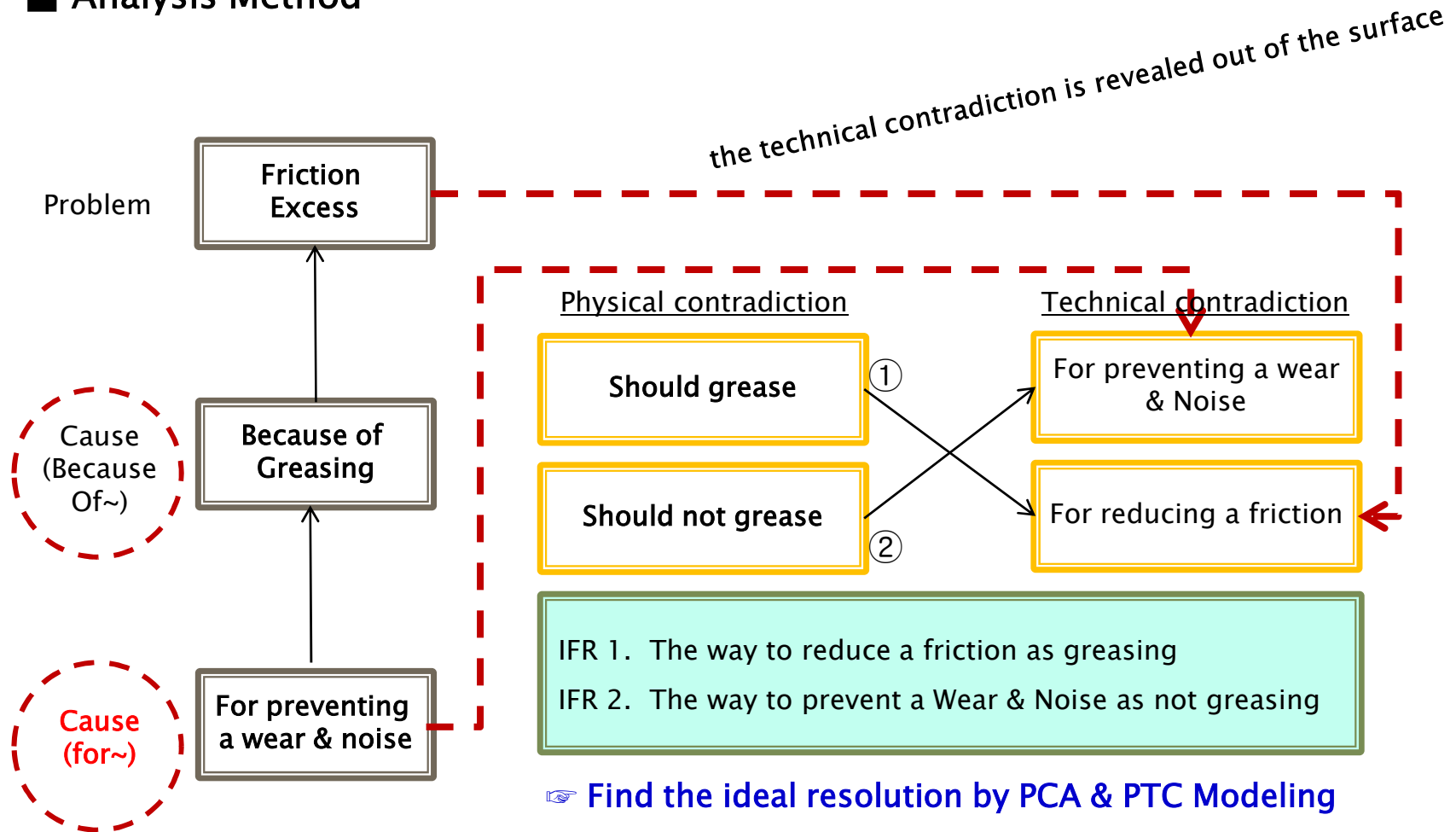
Ball Circulation structure



**Problem : Friction Excess after Greasing (getting worse the steering feel)**

# 4-3. Problem with contradiction (2)

## ■ Analysis Method



Ex. Set up the grease pocket. (separation of the time)

Make the grease viscosity milder. (#35. Parameter Changes)

## 5. Conclusion

1. The key of solving problems is to find a physical contradiction. Finding a physical contradiction is likely same to find its original cause.
2. The constraint factor of a problem without the contradiction is the fixed idea. and the constraint factor of a problem with contradiction is the contradiction itself.
3. We can find the ideal resolution on a problem without the contradiction by PCA.
4. We can find the physical and technical contradiction by PCA.
5. There are 3 problem modes. One problem mode has no contradiction and the others have the physical contradiction with which the technical contradiction is revealed out of the surface and not.
6. We can concentrate to find the ideal resolution more effectively and faster by using 3 mode problem analysis.