12th TRIZ Symposium

TRIZ Promotion into the Sony Semiconductor Group
~ Introduction, Training, Practice

2016.9.1

Sony Semiconductor Solutions Corporation
Akihiko Ikeda
Sony Semiconductor Manufacturing Corporation
Takeki Tanaka / Tsukazaki Hisanobu / Kouichi Owaki
Sony Group

Sony Corporation

Headquarters/Common platform

Sony Semiconductor Solutions Corporation

Semiconductor Business Group

Sony Semiconductor Manufacturing Corporation

manufacturing factory
Configuration

1) Sony Semiconductor Solutions Corporation
   (Old: Sony Corporation Semiconductor Gp)
   The history of TRIZ Introduction and Promotion Overview

2) Introduction of TRIZ into Sony Semiconductor Manufacturing(SCK)
The beginning
2004

Consult with the chief engineer?

Cannot get ...

Put forward ideas!

What should I do?

Development meeting

I want to support them somehow

Bust guts!

In-house instructor
Policy: Continuous improvement in outputs from the organization

1. Create a culture in client organizations
2. Support activities of client organizations
3. Grow up together with client organizations

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<tr>
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</thead>
<tbody>
<tr>
<td>Content</td>
<td>Course construction</td>
<td>Support continued use of</td>
<td>Independent operation by the site</td>
<td>Expanding support</td>
</tr>
<tr>
<td>Quality and quantity of activities</td>
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</tbody>
</table>

Year

- Introductory period
- Fixation period
- Quality improvement period
- Deployment period
Contents to provide

1. The development of a method to get innovative ideas
2. The development of the process
3. Development of promotion

SSS
TRIZ Unit
Quality Planning Section
Quality Planning Department
Quality Reliability Division

- Systematic training
- Process to use the knowledge
- Tool development

Division, Staff

1. Implementation of systematic training
2. Provision of actual working process
3. Expand support
   - Instructor training
   - Introduction support

Ideas skills
(Human resource development)

Practice

Patent-generating activities
(Achievement)

Development of promotion
Introduction of TRIZ into Sony Semiconductor Manufacturing (SCK)

- for manufacturing factory -

Sony Semiconductor Manufacturing Corporation
Human Resources Development Section
Human Resource Department
Takeki Tanaka / Tsukazaki Hisanobu / Kouichi Owaki
Contents

1. SCK Profile
2. Motivation
   (TRIZ in the SCK's problem-solving approach)
3. The history of promotion activity of TRIZ
4. Curriculums of TRIZ in SCK
5. Actual results
6. Epilogue
SCK Profile Company: Sony Semiconductor Manufacturing (SCK)

Founded: April 1, 2001
Headquarters: Kumamoto, Japan
Major Products: Semiconductor design, development, manufacture, customer service
Capital: 24.25 billion yen
Headcount: About 9,400 (as of Apr 1, 2016)
Sales: 474.9 billion yen (Fiscal year ended March, 2015)

Locations of factories:
- Yamagata technology center
- Shiroishi technology center
- Oita technology center
- Kunisaki satellite
- Nagasaki technology center
- Higashiura satellite
- Oita technology center
- Kagoshima technology center
- Kumamoto technology center
- Kagoshima technology center

Goals:
- Be a trusted and shining company
- Challenge to innovation
- Activate of the human resources and assets
- Outstanding manufacturing

Products:
- Image sensor
- Organic EL display
- MOS LSI
- MMIC
- Reflective LCD Display panel
## Motivation (TRIZ in the SCK’s problem-solving approach)

Introducing TRIZ in order to strengthen the "Improve" (Innovation from new ideas)

<table>
<thead>
<tr>
<th>Approach</th>
<th>Tools</th>
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<tbody>
<tr>
<td>Define</td>
<td>Customer diagram, BSC, Define diagram, EM method, Biz-CE diagram, CTQ List</td>
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<tr>
<td>Measure</td>
<td>Graph (Pareto diagram, etc.)</td>
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<tr>
<td>Analyze</td>
<td>CE diagram, EM method, Statistical Test, Statistical Estimation, Taguchi method, DOE, Multivariate analysis, etc.</td>
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<tr>
<td>Improve</td>
<td>Taguchi method, DOE, etc.</td>
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<tr>
<td>Control</td>
<td>Control Chart, Standard Operating procedure, Etc.</td>
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</table>

### What we want to do with "TRIZ".

**To strengthen the "improve"**

= To support the idea skills

⇒ Challenge to innovation

Develop creative human resources for our outstanding manufacturing.

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<table>
<thead>
<tr>
<th>Parameter: A</th>
<th>Parameter: B</th>
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<tbody>
<tr>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Bad</td>
<td>Bad</td>
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Ideal solution

- Aim the ideal solution in an innovative means.
- Find the optimal solution at the conventional way.

Relationship between A and B
The history of promotion activity of TRIZ

<table>
<thead>
<tr>
<th></th>
<th>FY2012</th>
<th>FY2013</th>
<th>FY2014</th>
<th>FY2015</th>
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<tr>
<td>Proposal to the president.</td>
<td>★</td>
<td>Explain TRIZ to officers one by one</td>
<td>One team has started training.</td>
<td>(Lectures and practice)</td>
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<tr>
<td>Internal award of Six Sigma (Gold)</td>
<td>★</td>
<td>Fab. A</td>
<td>Fab. B</td>
<td>Fab. C</td>
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<td>Fab. D</td>
<td>Fab. E</td>
<td>Transfer the process of Sony Corp.</td>
<td>Training of SCK’s Trainer. (Tanaka, Tsukazaki, Owaki)</td>
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- **Proposal to the president.**
  - We chose the theme.
  - Difficult.
  - Unresolved.
  - Couldn’t achieve goal by other way.

- **Explain TRIZ to officers one by one**
  - It seems good. But maybe other officers don't know TRIZ.
  - Firstly, you should explain to officers what "TRIZ" is. Then, investigate their needs.

- **One team has started training.**
  - (Lectures and practice)

- **Internal award of Six Sigma (Gold)**

- **Transfer the process of Sony Corp.**

- **Training of SCK’s Trainer.**
  - (Tanaka, Tsukazaki, Owaki)
Curriculums of TRIZ in SCK

We selected the items which suite us. We combined a lecture and a practice. The practice theme took up a business issue.

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<tr>
<th>Issue confirmation</th>
<th>NAZE-NAZE-Tenkai</th>
<th>Function Analysis</th>
<th>IFR + 40 Principles</th>
<th>40 Principles</th>
<th>Technical contradictions</th>
<th>Physical contradictions</th>
<th>Technical System Evolution/How to get idea</th>
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We trained the three in-house trainers and expanded TRIZ to five Fab. in three years.

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<td>43</td>
<td>10</td>
<td>31</td>
<td>9</td>
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**Total: 24 Theme**

**Total: 117 People**
Many teams have gotten internal commendations.

<Sony Six Sigma Award>

2012/2nd 【Gold medal】PJ name: Improvement about performance of washing

2013/1st 【Gold medal】PJ name: Establishment of package technology

2014/1st 【Gold medal】PJ name: Establishment of Assembly-process

2014/2nd 【Gold medal】 PJ name: Technical study on the new structure

2015/1st 【Silver medal】PJ name: Improvement of a package process

<Internal improvement activities Award>

2015/Oct. 【Gold medal】 PJ name: Reduction in recipe making time
Epilogue

<Our impressions>

- If **the purpose and goal are not defined**, the project is going off the track in the middle.
- We recognized **the importance of pre-analysis** for the idea.
  If we don’t think logically, we tend to use our wrong assumption,
  As a result, it takes enormous time for problem solving.
- **In the team-based problem solving**, people can analyze the situation with various perspectives and creative thinking.
- People can easily master TRIZ, if **they practice it just after learning**.
- TRIZ is effective **for manufacturing sites**.
  (Not only for planning dept./development dept.)

<Acknowledgments>
Thank you very much to Mr. Ikeda (Sony), Mr. Nagase (Sony) and the others who cooperated in implementation of TRIZ.
Thank you for your attention.