Proposal and field practice of a method for promoting CMC hiyarihatto activity

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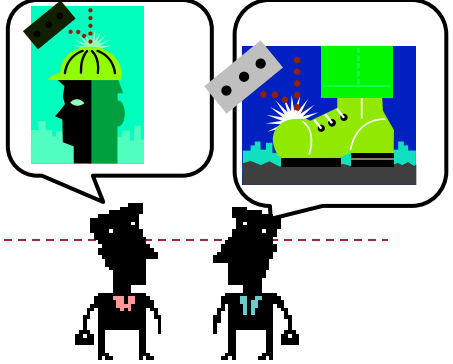
Introduction



- Hiyarihatto activity
  - Effective activity for cultivation of safety attitude
  - Discussion in a small group
  - Topics are hiyarihatto(incident cases)
  - Face-to-face discussion (SHIGEMORI 2009)
- Hiyarihatto activity in nuclear power plants
  - It is difficult to continue the activity.
  - Participants are busy.
  - Geographically dispersed
- Purpose of this study
  - To propose a method for promoting hiyarihatto activity in nuclear power plants
    - Asynchronous and distributed CMC(Computer Mediated Communication)
    - Socio psychological method for promoting talking

Target participants in this study

- Field supervisors
  - Are reasonable for field works in nuclear power plants.
  - Lead field workers' safety attitude.

Requirements of hiyarihatto activity in nuclear power plants(1)

- Practicable in nuclear power plant organization
  - Continue without disturbing other works
- Anonymousness
  - To avoid hesitation to talk
  - It is difficult to talk about their own incidents.
- Spontaneous participation
  - For continuous activity (HORIE 2007)
  - Self determination theory (DECI 1996)

Requirements of hiyarihatto activity in nuclear power plants(2)

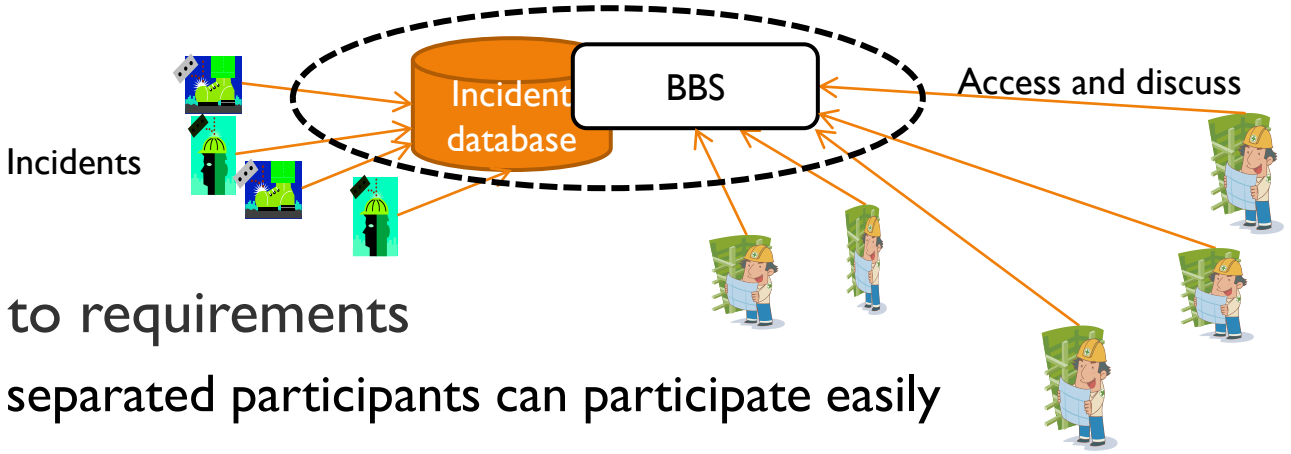
- Encouraging speaking
  - To avoid social loafing (LATANE 1981)
- Encouraging of thinking about causes and measures of incident cases
  - To cultivate safety attitude through understanding and enhancing sensitivity to incidents (SHIGEMORI 2009)
- Geographically separated participants can easily participate
  - separated participates have useful knowledge for sharing

Problems of an existing method

- An example of hiyarihatto activity method (SHIGEMORI 2009)
  - Face to Face discussion about incidents
    - Anonymous discussion is difficult.
    - Geographically separated participants need much time to gather.
  - Facilitator
    - Encourage speaking.
    - Cannot promote spontaneous participation.
      - Only passive participation

Proposal of a method for promoting hiyarihatto activity in nuclear power plants

- Asynchronous distributed CMC* hiyarihatto activity
  - With web-based incident database and electronic bulletin board(BBS) system "hiyarihatto sharing system"



  - Corresponding to requirements
    - Geographically separated participants can participate easily
    - Anonymousness
  - Participants do
    1. Submitting incident cases to the database
    2. Reviewing incident cases and discuss these cases in BBS

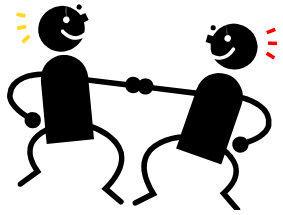
*Computer Mediated Communication

The proposed method features Introduction of active participants

- Active participants
  - Corresponding to requirements
    - Encouraging speaking
    - Spontaneous participation
  - One active participant is included in a group.
  - Requested to follow action guidelines(next slide).
- Three main features
  1. Hidden from normal participants(participants except for active participants).
     - To draw normal participants' conformity
     - To regarded as a normal participant
  2. Behave actively
     - To increase pace of posting messages
  3. Control contents of messages
     - To build a good social relationships in a group

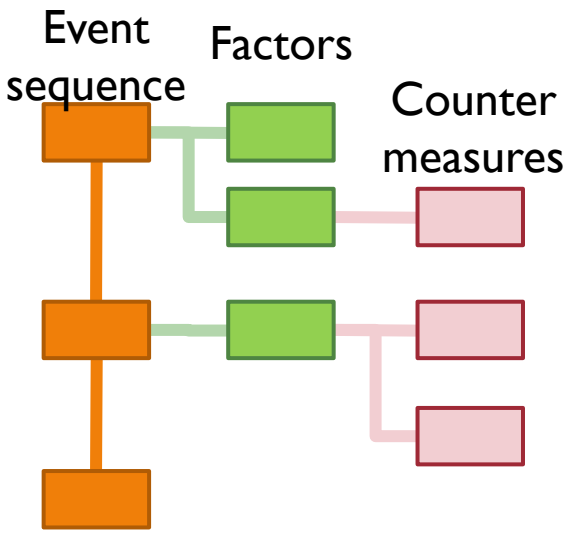
Action guidelines for active participants

- To draw conformity (LATANE 1981)
  1. "Post a message to bulletin board as the beginning of the group"
- To build a good social relationships (e.g., BALES 1905, GARRISON et al. 2000)
  2. "Post positive messages such as compliment"
  3. "Agree to messages or incident cases"
  4. "Reply messages if there are no reply"
- To encourage speaking directly
  5. "Ask other participants to new messages"

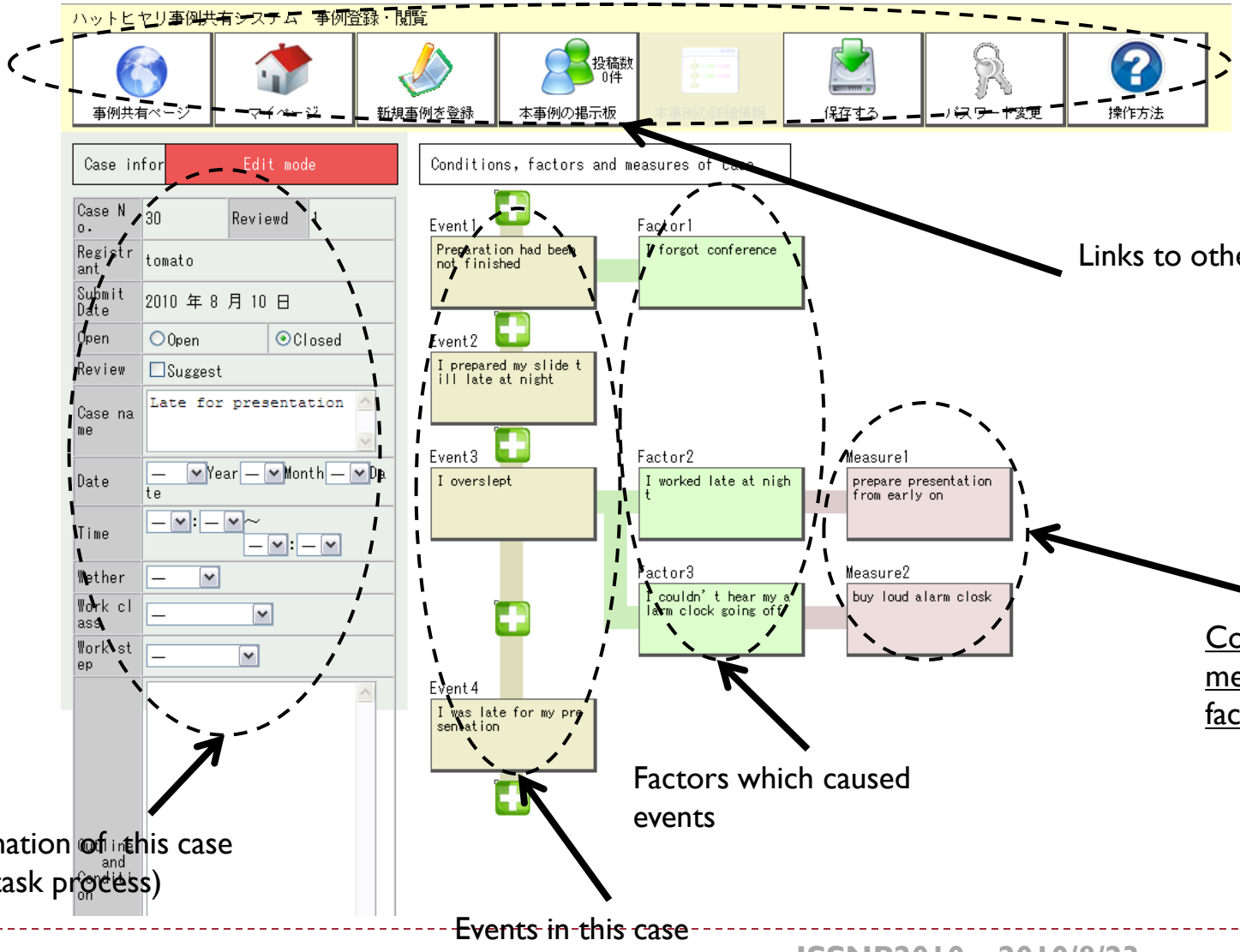


The proposed method features Introduction of RCA form

- RCA(Root Cause Analysis)
  - An analysis method
  - Analyze root causes of accident cases
  - For taking countermeasures against these
- RCA form
  - Used in RCA
  - Graphic representation of an accident case
    - An event sequence in the accident
    - Factors (causes) tree of these events
    - Countermeasures to these factors
  - Corresponding to requirements
    - Encouraging of thinking about causes and measures of incident cases



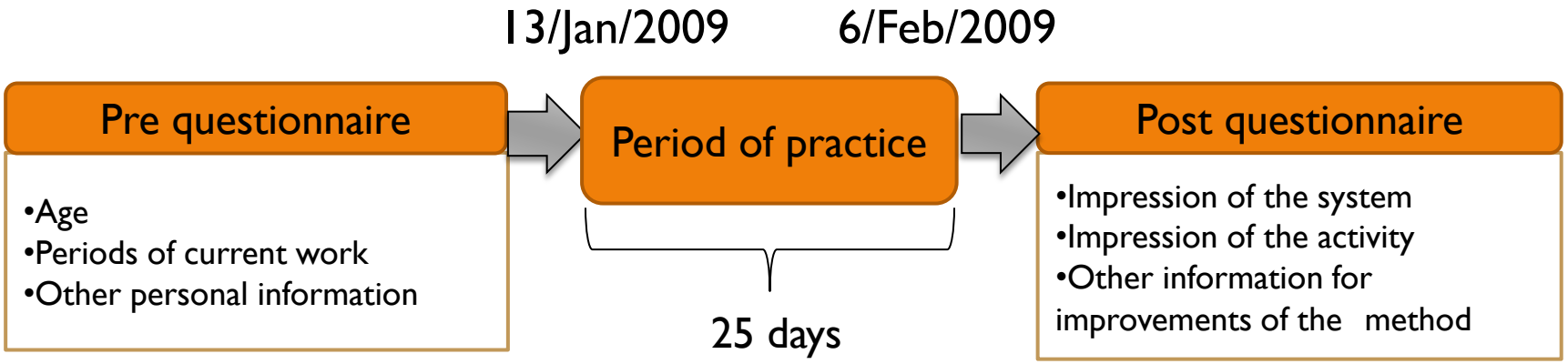
A screenshot of RCA form



Field practice of the proposed method

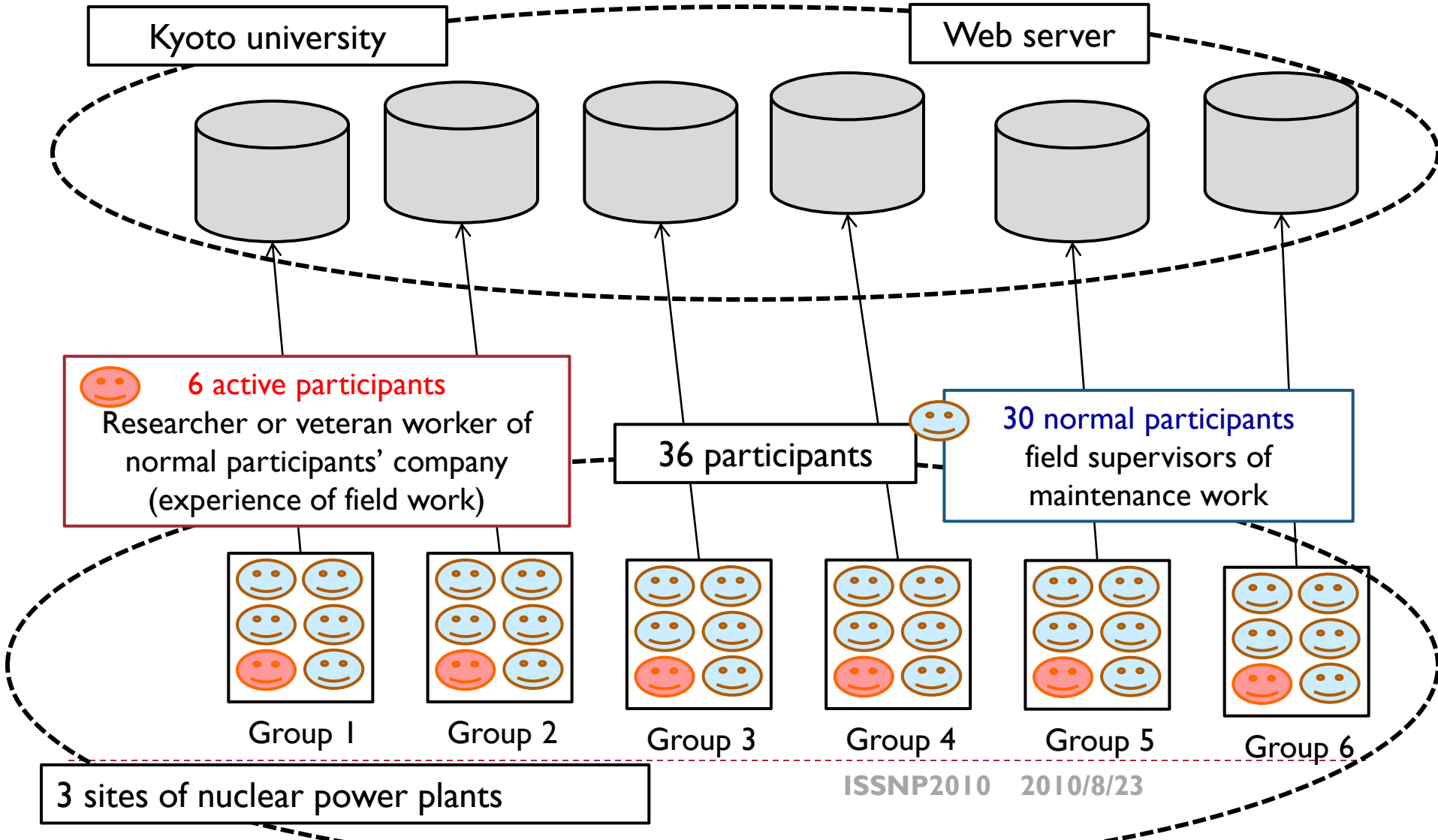
- Purposes of the practice
  1. To confirm that normal participants
     who work in actual nuclear power plants
     continue the activity with the proposed method
  2. To confirm that active participants follow action guidelines
  3. To confirm that active participants promote posting messages of normal participants
  4. To find improvements of the proposed method

Method of the practice



- Data collection
  - Time, number, and contents of submitted cases or posted messages in bulletin boards
- Partially spontaneous participation
  - Request to participate in the practice
  - Without disturbing other works
  - Freely discuss

An overview of the practice



Results and discussions

- Normal participants are classified

Average	Login	Visit BBS	Post message	Submit case	#
Dropout	7.0	0.3	0.0	1.9	8
Lurker	13.6	8.9	0.3	3.1	9
Regular	34.2	77.6	12.8	6.6	9
Active participant	11.7	50.5	13.8	0.3	6
Total	19.2	38.7	7.0	3.6	36

#: The number of each type participants

- Normal participants continued the activity
  - except for dropouts and lurkers
- Reasons of being dropout or lurker
  - "*I was busy*" (from five dropouts and five lurkers)
  - "*I am busy in regular facility inspection periods, but I can join the activity in other periods.*"(from four normal participants)

Did active participants follow action guidelines?(1)

"Post a message to bulletin board as the beginning of the group"

- Posting order of the first message of active participants in each group

Group 1	3rd
Group 2	2nd
Group 3	1st
Group 4	1st
Group 5	23rd
Group 6	1st

- Comment from the active participant of group 5
  - "*I dropped my guard when other participants submitted cases and posted messages at the beginning of the practice.*"

Did active participants follow action guidelines?(2)

*multiple count or uncounted messages are allowed

- Active participants' messages are counted.

	Message request	Reply	Positive Message	Agreement	*Message total
Group 1					
Group 2	3	5	6	2	19
Group 3	9	5	3	3	14
Group 4	5	1	0	0	15
Group 5	7	11	7	3	16
Group 6	2	0	1	0	6

"Ask other participant to new messages"

- Difference between each groups
- Because of ambiguous presentation of action guidelines

Did active participants control normal participants' contents of messages?

Active participants

	Message request	Reply	Positive Message	Agreement	Message total
Group 1	6	2	1	1	13
Group 2	3	5	6	2	19
Group 3	9	5	3	3	14
Group 4	5	1	0	0	15
Group 5	7	11	7	3	16
Group 6	2	0	1	0	6

- Active participants posted about the same number of messages except for group 6
- But the number of messages of normal participants were far from same.
- Positive message encourage posting messages.

- Contents of messages of normal participants resemble that of active participants except for group 5.
- Active participants controlled contents of messages.

Normal participants

Group	Message request	Reply	Positive Message	Agreement	Message total
Group 1	3	5	0	0	9
Group 2	0	19	11	11	30
Group 3	18	38	6	14	95
Group 4	2	1	0	0	3
Group 5	3	13	2	2	32
Group 6	0	0	0	0	0

Proposal of improvements of the proposed method

- A group should include participants from more sites, or more companies.
  - To avoid overlap of regular facility inspection periods
  - Regular facility inspections are conducted in schedules of each site or company.
- Action guidelines should be more clearly presented.
  - In particular, following two guidelines are important.
  - "Post a message to bulletin board as the beginning of the group"
  - "Post positive messages such as compliment"

Summary

- The method for promoting hiyarihatto activity was proposed and practiced in an actual nuclear power plant organization.
- The results showed that
  1. Normal participants who work in actual nuclear power plants continue the activity with the proposed method.
     - It is difficult to continue the activity in regular facility inspection periods.
  2. Active participants followed action guidelines.
     - Action guidelines should be more clearly presented.
  3. Active participants promoted posting messages of normal participants.
- Some improvements of the method were found.