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Input paper for the following Committee(s): check as appropriate Purpose of paper:

**□** ARM **□** ENG **□** PAP **□** Input

**□** ENAV **X** VTS **X** Information

Agenda item [[2]](#footnote-2) 8

Technical Domain / Task Number 2 …………………………………

Author(s) / Submitter(s) Korea Coast Guard

Study for effects of message markers

# DOCUMENT PURPOSE

When VTSOs are communicating with non-English native speakers by English, Some of seafarers do not communicate properly due to lack of communication skill.  
It is highly possible that intention of VTSO is not delivered clearly, when providing information or instruction the seafarers who are not proficient in English.  
These communication problems make miss-communication between VTS and Ship, it can be lead to danger or accident.

The use of message marker will be one of solution for all VTS users including the seafarer who are not proficient in English. This study suggests the use of message markers in VHF communication. And in this study, it is try to find out how message markers affect SMCP text as follows:

* Compare between usual text and message marker text to know the difference and then try to find out which one is more efficient way in VHF communication.
* Conduct a survey to know VTS users` preference for using message markers.

# RESEARCH METHOD

To compare between usual text and message marker text, this study conducted as follows:

* Selection of text
* Transformation to message marker text
* Comparison between original text and message marker text
* Comparison of frequencies in use of message markers and word counts

Also, conduct a user survey to identify users` preferences and awareness of message marker.

## Selection of text

In this study, it was selected that 284 sentences of SMCP part A AI/6 "Phrases for providing VTS Service" and 35 sentences of emergency check list of KCG VTS manual.

The reasons for selecting SMCP Part A AI/6 and Emergency check list of KCG are as follows:

* SMCP is the standard of maritime communication in practical and especially Part A AI/6 contains a number of phrases for VTS.
* Emergency check list of KCG contains phrases for emergency situation and was selected to find out the affect of message markers on emergency situation.

## Transformation to Message marker text

The texts which are selected as paragraph 2.1 are transformed to message marker text for comparison, depending on whether message markers are used. (See table 1)

And it was determined properly that the message markers to transform according to the contexts of the sentence because there is no standard phrase using message markers.

1. *How to transform from Original text to Message marker text*

|  |  |  |
| --- | --- | --- |
|  | **Original text** | **Message marker text** |
| INSTRUCTION | Do not anchor in position … | INSTRUCTION, Do not anchor in position … |
| ADVICE | Alter course to ... of you. | ADVICE, Alter course to ... of you. |
| WARNING | You are getting closer to the vessel … of you. | WARNING. You are getting closer to the vessel … of you. |
| INFORMATION | The pilot boat is coming to you. | INFORMATION, The pilot boat is coming to you. |
| QUESTION | What is your ETA in position ...? | QUESTION, Your ETA in position ... |
| ANSWER | My maximum draft is ... metres. | ANSWER, My maximum draft is ... metres. |
| REQUEST | Repeat your position for identification. | REQUEST, Repeat your position for identification. |
| INTENTION | I will stay in position ... until … | INTENTION, I will stay in position ... until … |

## Comparison between Original text and Message marker text

Comparison between Original text and message marker text is conducted based on the number of words and reading time. The standard of measure is as follows:

* The number of words: it was based on word spacing that the number of words contained each sentence. (e.g. My / ETA / is / One / Two / Zero / Zero: Total 7 words)
* Reading time: 120 WPM (Word per Minutes)

Note: 120 WPM is recommended by IALA G1132 “VTS VOICE COMMUNICATION”

## Comparison of frequencies in use of message markers and word counts

To knowing which Message markers were used frequently in SMCP Part A AI/6, each Message marker text was classified to find out frequencies of the use of message markers. Then it was compared and counted that the data and words by the types of message markers.

## User survey for Message marker text

User survey has been conducted to know VTS users` opinion about the use of message markers and 55 of seafarers answered this survey.

# SMCP TEXT ANALYSIS

284 sentences in SMCP Part A AI/6 were used for analysis and these sentences were selected because they have been used frequently by VTS during VHF communication. Text analysis was compared word count and reading time between Original text and Message marker text.

## Comparison result for word count of SMCP text

Figure 1 is the comparison value which is total words of SMCP Part A AI/6 text and Message marker text. The total words of SMCP Part A AI/6 text are 2,546 words and total words of Message marker text are 2,758 words (See Figure 1). These two values show the difference of 212 words and message marker text is used more words than Original text.

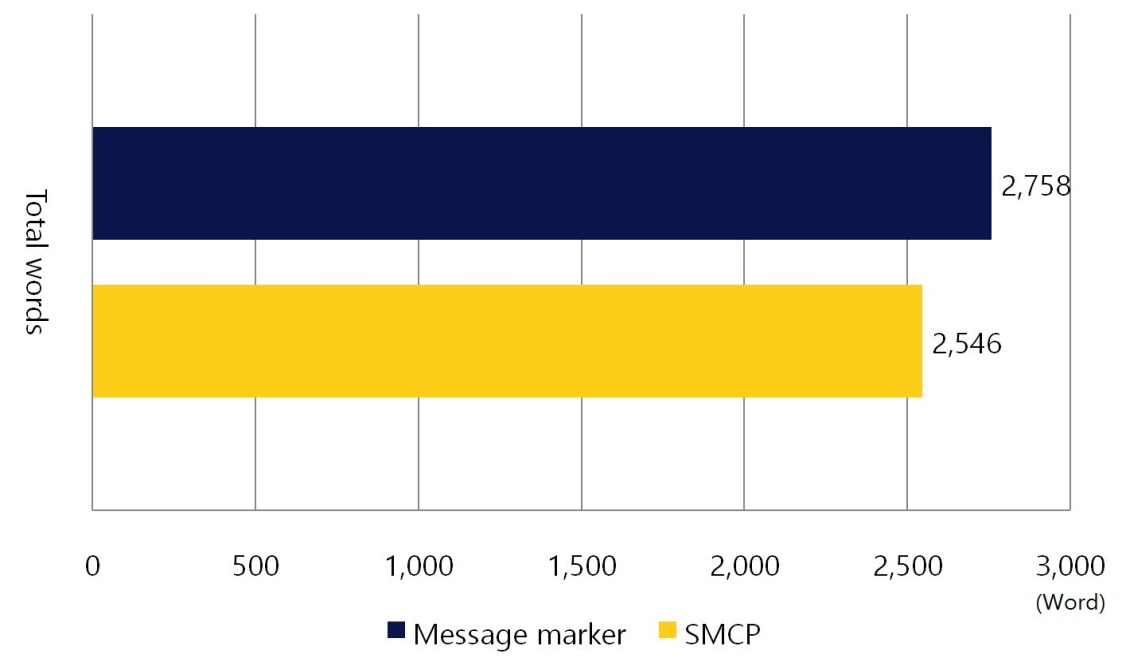
Figure 2 is the comparison value which is the average number of words of SMCP Part A AI/6 text and Message marker text. SMCP Part A AI/6 text is used the average 8.96 words and message marker text is used 9.71 words (See Figure 2), so the result was message marker text was used 0.75 word more than original text.

The reason why the differences of the values came out was the usage of message marker. When message markers are used, they always put forward of body text. (e.g. QUESTION. Your ETA.)

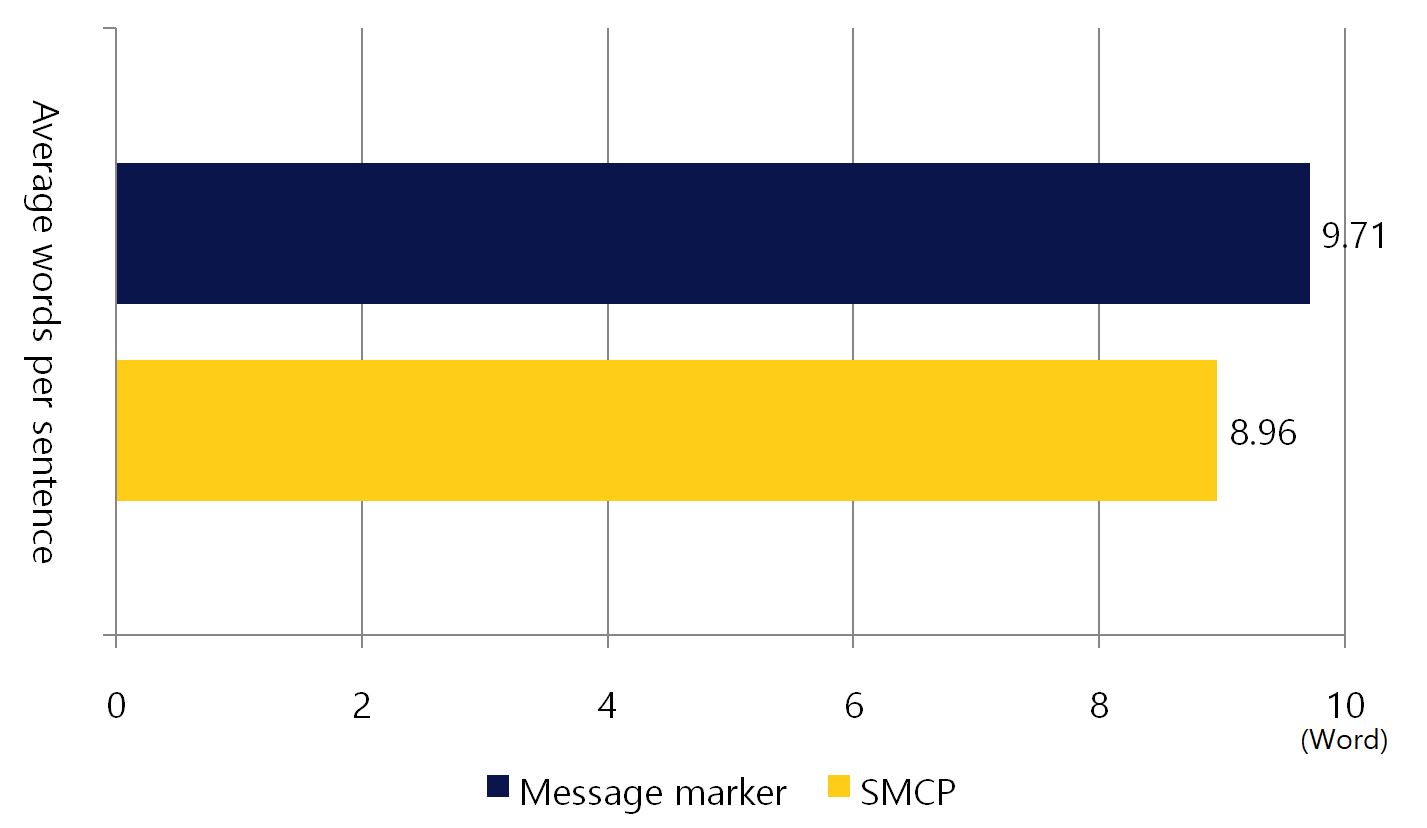
So the cause of the difference was thought that message markers were added to every texts. Therefore it was caused that message marker text was used more words than original text.

Because the difference value at Figure 1 is 212 words and the total sentences of SMCP Part A AI/6 text are 284 sentences. So the difference between those two values is similar and the difference of average words is about 1 word per each sentence.

Note:



1. *Comparison Value for Total words of SMCP paragraphs*

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1. *Comparison Value for the average number of word of each SMCP sentence*

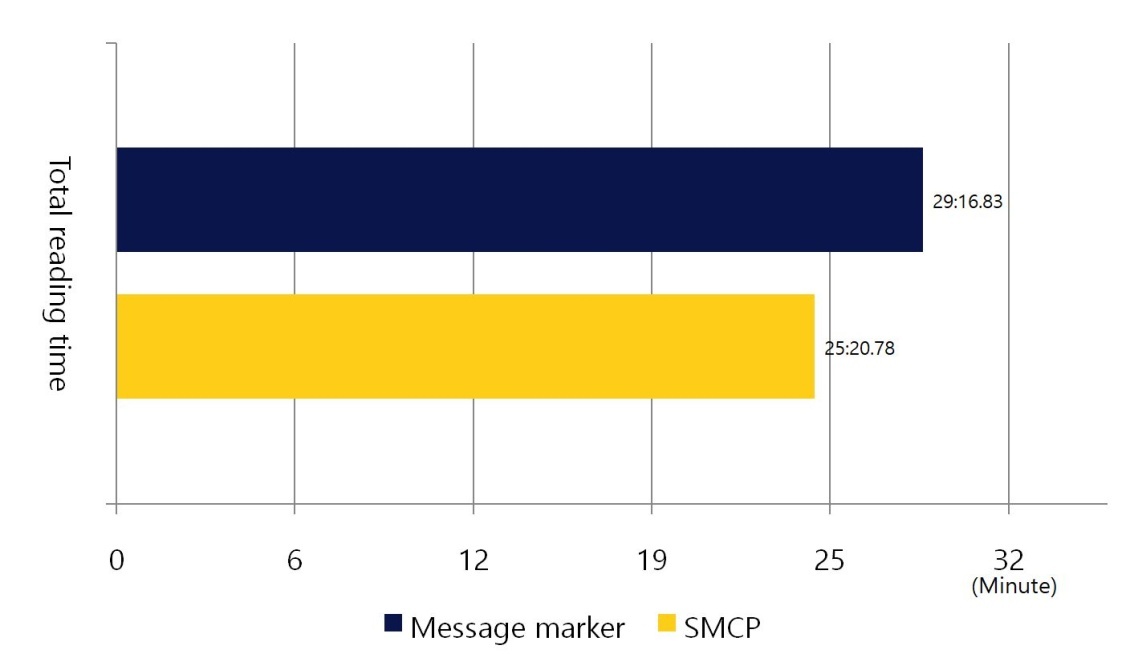
## Comparison result for reading time of SMCP text

Figure 3 shows the total reading time of SMCP Part A AI/6 text and message marker text by 120 WPM. The total reading time of original SMCP text is 25 minutes 21 seconds and message marker text is 29 minutes 17 seconds (See Figure 3).

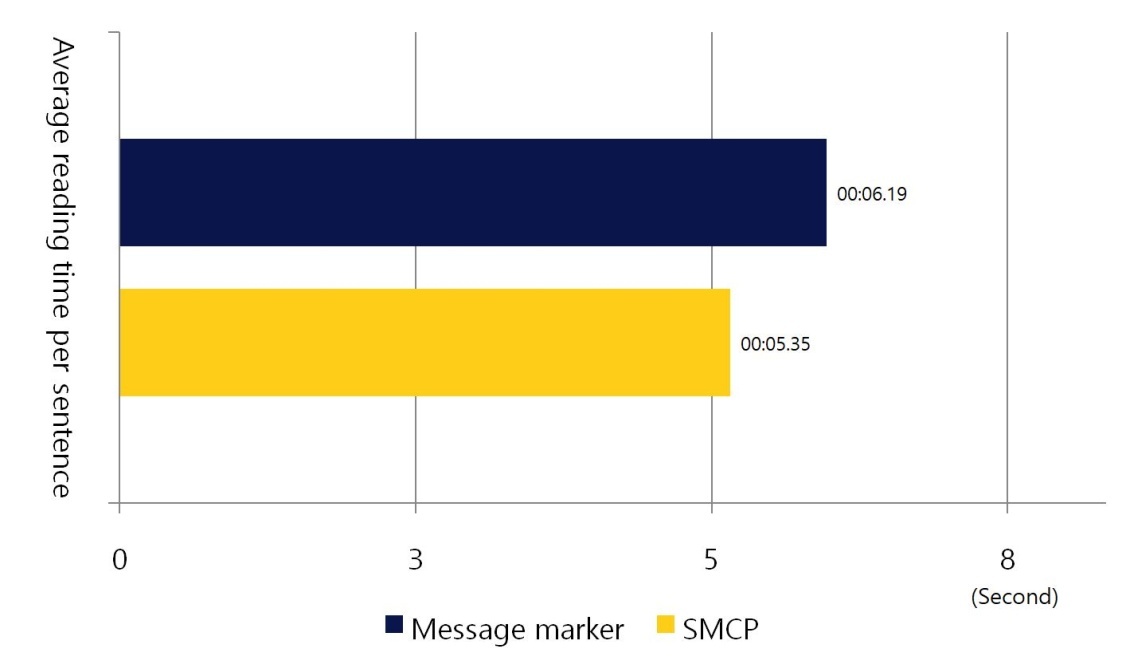
Figure 4 is the average reading time to each sentence. The average reading time of SMCP text is 5.25 seconds per sentence and message marker text is 6.19 seconds per sentence (See Figure 4).

The difference of the total reading time is that message marker text takes 3 minutes 56 seconds (approximately 4 minutes) more than SMCP text and the average reading time per sentence is also message marker text takes 0.84 seconds (approximately 1 second) more than SMCP text.

So the result is thought that increasing words at paragraph 3.1 affect on the reading time.



1. *Total SMCP paragraphs reading time*

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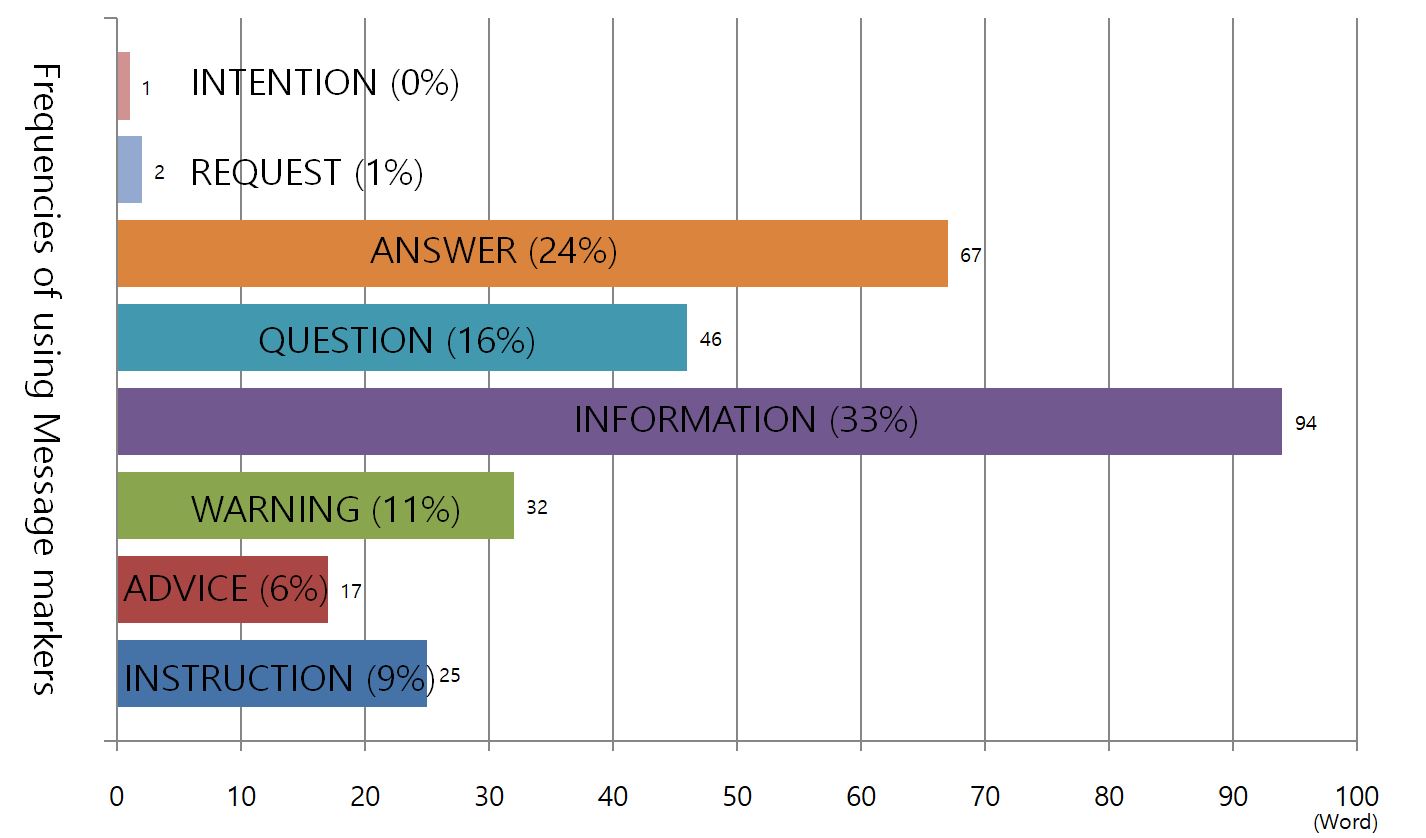
1. *Average reading time to each SMCP sentence*

## Frequencies of using Message markers

Figure 5 shows the frequencies of using message markers, when 284 sentences of SMCP Part A AI/6 were transformed to message marker text and the result of Figure 5 is as follows:

* + INFORMATION: 33%
  + ANSWER: 24%
  + QUESTION: 16%
  + WARNING: 11%
  + INSTRUCTION: 9%
  + ADVICE: 6%
  + REQUEST: 1%
  + INTENTION: 0%

The reason of this result may be thought that SMCP Part A AI/6 is intimately related with VTS and giving information is the one of most important role of VTS. So Figure 5 shows message marker “INFORMATION” is the most frequently used between others, on the contrary message marker “INTENTION” is rarely used. Therefore the result of Figure 5 indicates that the frequencies of using message markers at SMCP Part A AI/6 is related with VTS tasks.



1. *Frequencies of using Message markers*

# KCG VTS MANUAL TEXT ANALYSIS

35 sentences in Emergency check list of Korea Coast Guard VTS manual were used for analysis and these sentences were selected to find out the affects of message markers during emergency situation. Text analysis was progressed same as paragraph 3 procedures that compared word count and reading time between original VTS manual text and message marker text.

## Comparison result for word count of KCG VTS manual text

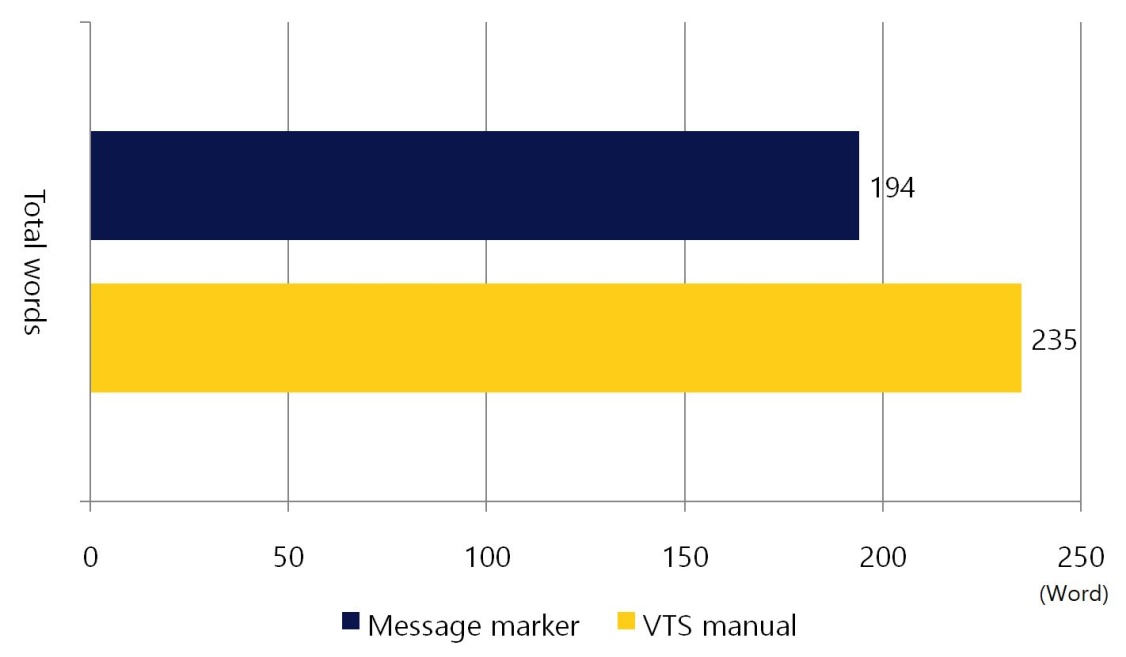
Figure 6 is comparison value of the total words between original KCG VTS manual text and message marker text and Figure 7 is comparison value of the average word count of each sentence. Total words of KCG VTS manual text are 235 words and Total words of message marker text are 194 words (See Figure 6). And the average words per sentence of KCG VTS manual text are 6.71 words, message marker text are 5.54 words (See Figure 7).

The Comparison values shows 41 words of total words and 1.17 words of the average words difference, both values are indicated original KCG VTS manual text uses more words than message marker text.

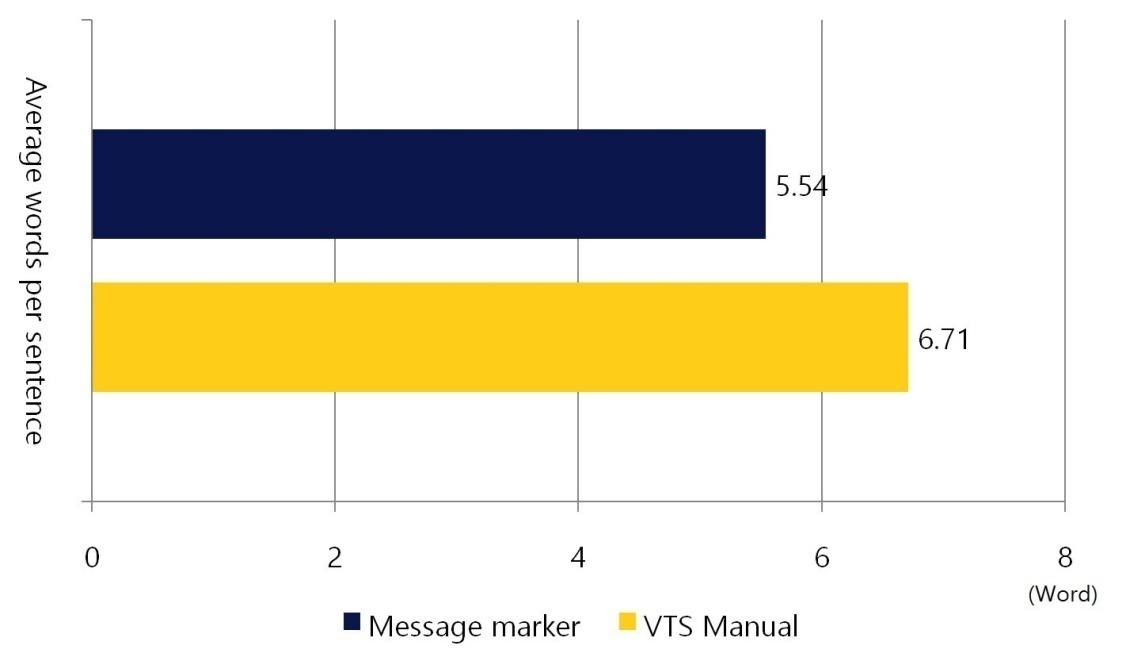
It is thought that the reason why the values of Figure 6 and Figure 7 are not same as Figure 1 and Figure 2 of paragraph 3 is because of characteristics of message marker “QUESTION” and KCG VTS manual check list text.

Message marker “QUESTION” is used for interrogative phrases and if “QUESTION” is added to body text as a message marker, it can be condensed sentences such like “QUESTION, Noun / Noun phrases” form (e.g. QUESTION, freeboard / your freeboard). As a result of it, message marker text can be used fewer words than original text only in case of interrogative phrases. This characteristic can be found to SMCP Part A AI/6 text, the result of comparison of total words between Message markers (See Figure 8) shows that only “QUESTION” indicate the total words of message marker text are smaller than the total words of SMCP text.

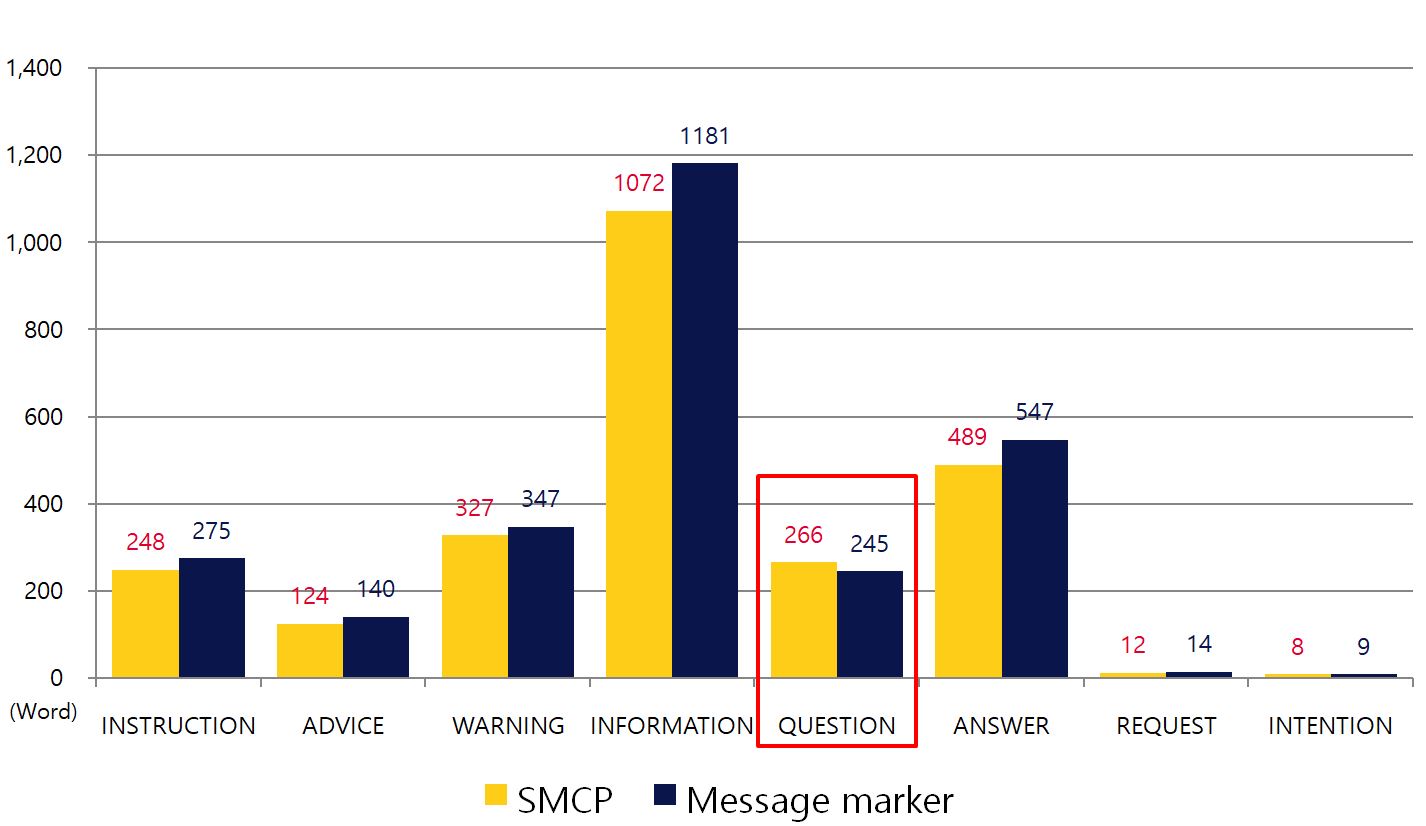
Also the purpose of KCG VTS manual check list text is collecting information from the ship which is in emergency situation. Therefore it should be contained a lot of interrogative phrases than SMCP text and consequently the result of Figure 6 and Figure 7 shows opposite values of Figure 1 and Figure 2.



1. *Comparison Value for Total words of KCG VTS manual paragraphs*

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1. *Comparison Value for the average number of words to each KCG VTS manual sentence*

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1. *Comparison of total words between Message markers*

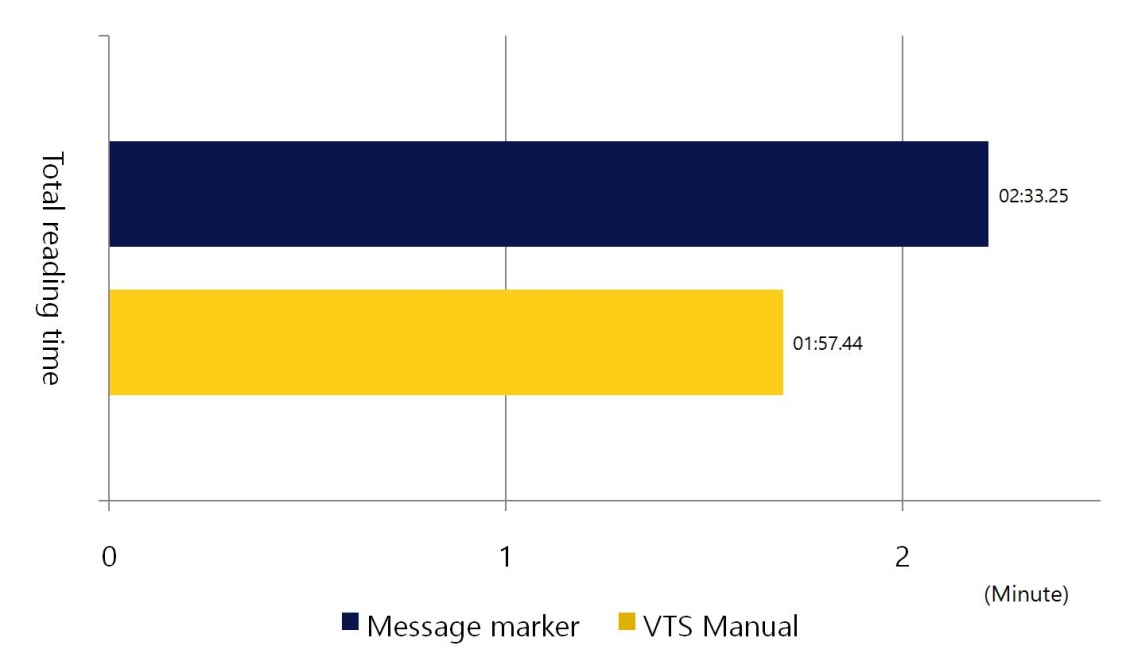
## Comparison result for reading time of KCG VTS manual text

The result value of Figure 9 which shows the total reading time of KCG VTS manual text indicate that original VTS manual text is 1 minute 57 second to read and message marker text is 2 minutes 33 second to read (See Figure 9). Also the result values of the average reading time per sentence are original VTS manual text is 3.36 seconds and message marker text is 4.38 second. The difference between both values are 36 seconds of total reading time and 1.02 seconds of average reading time per sentence, and it is indicated that message marker text spend more time than original VTS manual.

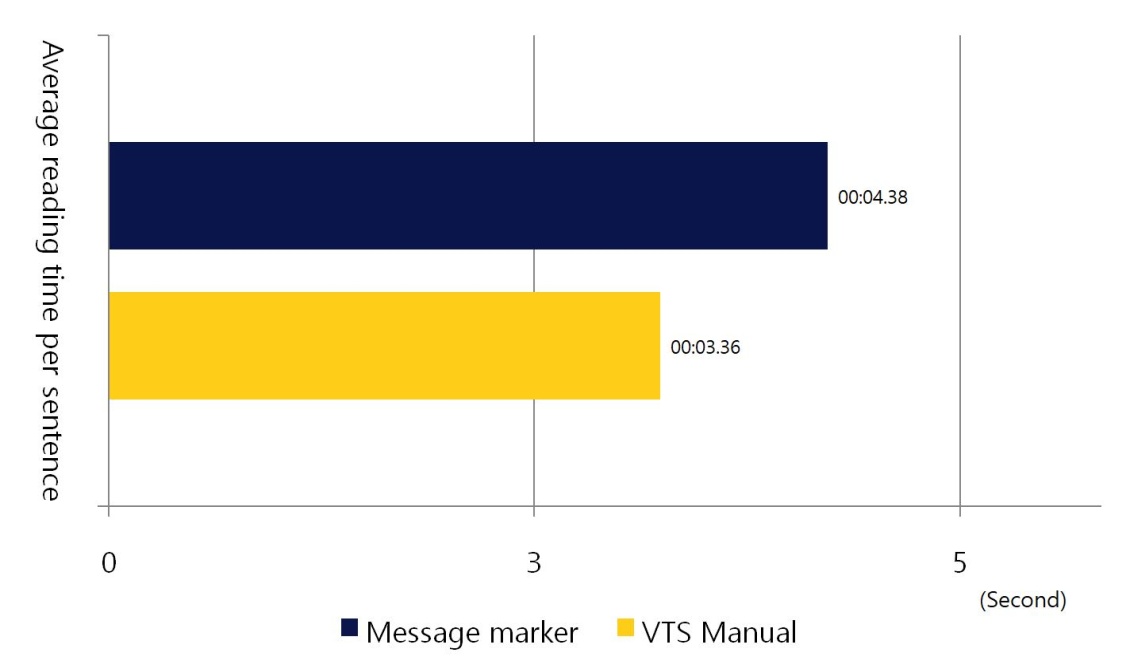
Although message marker text uses fewer words than original VTS manual text, the total reading time and the average reading time were increased. Therefore it is thought that other factors affect on the result and the factors which affect on the result are thought linking sound and the number of pauses.

The original text can be reading in one breath and pronounce a word with a linking sound (e.g. [What is your] full speed?) but message marker text has many pauses when someone read the text as same speed by 120 WPM (e.g. [Question], full speed.).

As a result message marker text takes more time than the original text because of pause when reading a sentence. However it is thought that the pauses make clear to pronounce sentences and also improve listener`s understanding, but further research is needed to find out objective basis.



1. *Total Manual text reading time*



1. *Average reading time to each Manual text*

# USER SURVEY

## Target of user survey

User survey was conducted for 55 officers and 37 of respondents were Korean, 13 were Pilipino and 5 were Myanmar.

## Composition of questionnaire

The questionnaire will be comprised questions about message marker, question 1 was to know awareness of message marker, question 2 was to know used experiences about message marker and question 3 to 5 were compared message marker text and non-message marker text. And “QUESTION, Noun / Noun phrases” form was put into question 4 to know reaction of the condensed sentences.

1. *Questionnaire about Message Markers*

|  |  |
| --- | --- |
| **Questionnaire about Message Markers** | |
| Q1 | Do you know “Message Marker” for VHF communication? |
| 1. Yes 2. No |
| Note: Message marker is the tool which is consist of 8 words and used to increase the probability of the purpose of the message being properly understood during VHF communication.  (e.g. Instruction, Advice, Warning, Information, Question, Answer, Request, Intention.) | |
| Q2 | Have you ever experienced “Message marker” during VHF communication? |
| 1. Yes 2. No |
| Q3 | Which sentence is more clearly to understand when you communicate on VHF? |
| 1. Vessel is crossing traffic lane on course 180 and speed 7 knots in position 35-12N 126-13E. 2. Information, Vessel is crossing traffic lane on course 180 and speed 7 knots in position 35-12N 126-13E. |
| Q4 | Which sentence is more clearly to understand when you communicate on VHF? |
| 1. What is the name of your vessel and call sign? 2. Question, 1. the name of your vessel 2. Call sign. |
| Q5 | Which sentence is more clearly to understand when you communicate on VHF? |
| 1. Transit speed is 5 knots. 2. Instruction, Transit speed is 5 knots. |

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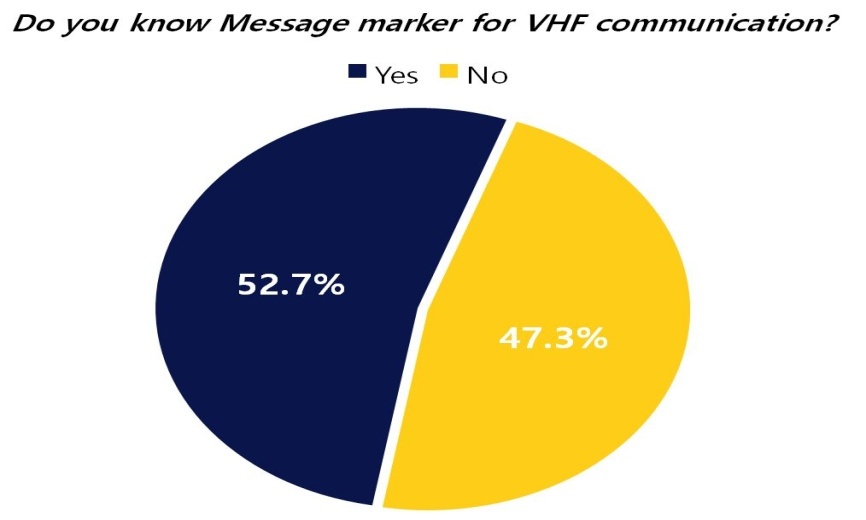
## Method of the survey

The questionnaire was handed out to the persons in charge of H.R. teams of shipping companies, and then extracted the data by compiling the survey result.

## The result of user survey

### Awareness of message marker

The answer of question “Do you know message marker for VHF communication?” was 52.7% of the respondents answered “Yes” and 47.3% of the respondents answered “No” (See Figure 11). The survey result showed that the half of respondents didn`t know message marker. Therefore education for message markers will be needed for seafarers.

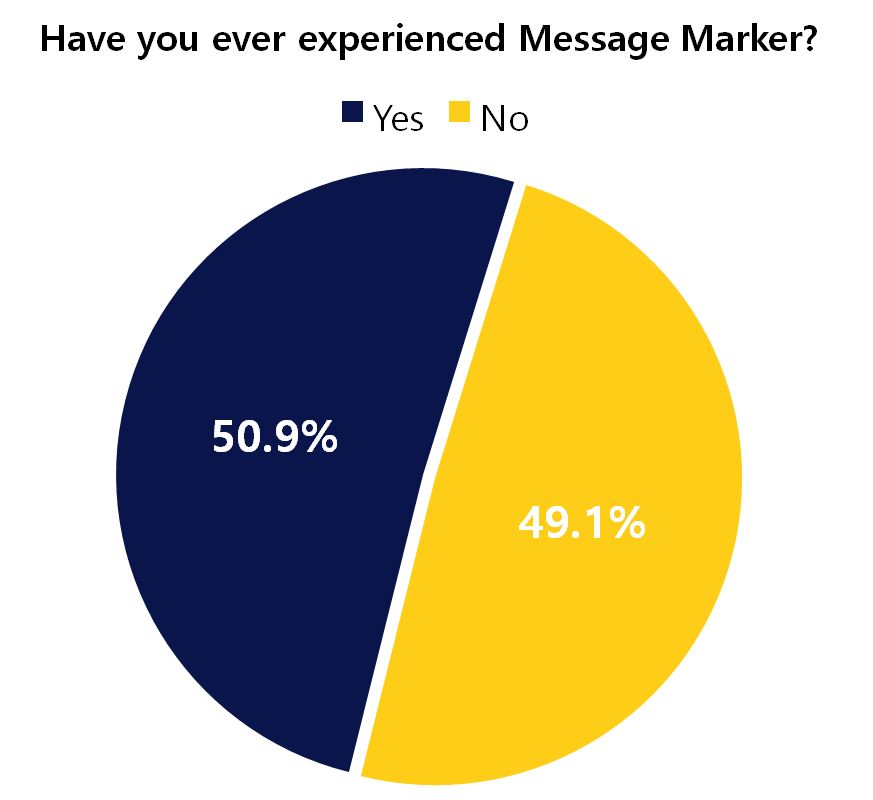


1. *Awareness of Message marker*

### Used experiences about message marker

The question 2 was “Have you ever experienced message marker?” and 50.9% of the respondents answered that they had experienced message marker, another 49.1% of respondents answered that they had not experienced message marker during VHF communication (See Figure 12).

This result was similar with the result of question 1 and this result means there had possibility that they didn`t recognize message marker even they had experienced message marker from VTS or other ships because they didn`t know message marker.

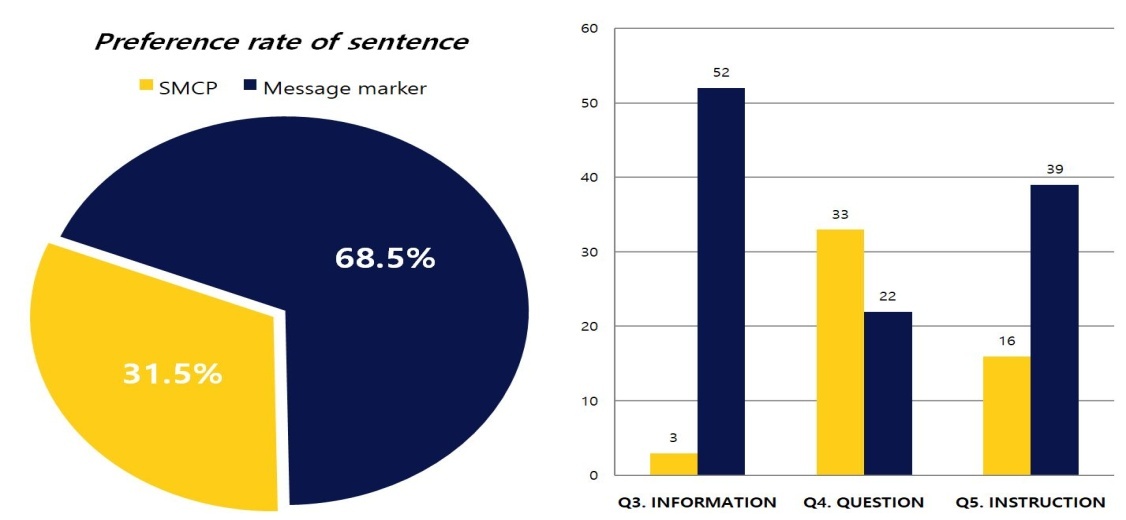


1. *Experience of using Message marker*
2. The Survey for the preference about message marker text

The Question 3 to 5 was to find out preferences of respondents between message marker text and non-message marker text. 68.5% of the respondents answered that message marker text was clearly to understand and 49.1% of the respondents answered that non-message marker text (SMCP) was more clearly to understand (See Figure 13).

This result indicated message marker text was more clearly to understand than non-message marker text for VTS users and it was helpful the use of message marker during VHF communication.

And the preference of message marker text was higher than non-message marker text at question 3 and 5 but only question 4 showed that non-message marker text was higher than message marker text. It will be considered that users don’t prefer condensed form such as “Message marker + Noun” because VTS users are more familiar with the form of “Message marker + SMCP” than the condensed form.

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1. *Preference between Original text and Message marker text*

# CONCLUSION OF THE RESEARCH

## Word count

The results showed that the average word count of message marker text increased approximately 1 word and the reason of the result was the use of message marker led increasing word count.

And when message markers were used for communication, interrogative phrases were more effective than others because interrogative phrases could be used the condensed form such as “Message marker + Noun”. This advantage made the use of message marker effective during emergency situation.

## Reading time

The reading time of message marker text took approximately 1 second more than non-message marker text and the factors that affect reading time were word count, the number of pauses during reading. However 1 second is an insignificant difference in practical VTS tasks and it will need more studies to find out the effect of message markers during the time of whole VHF voice communication.

## User survey

The result of user survey showed that VTS users prefer message marker text regardless of awareness or experience of message marker because the result of survey about awareness of message markers was 47.3% of respondents answered they don`t know message markers and 49.1% of the respondents answered they haven`t experienced use message marker. However the answer that message marker text more clear to understand was 37% more than non-message marker text.

Also it was thought that respondents preferred “Message marker + SMCP body text” to the condensed form but more detailed research will be needed to accurately know the effect of message marker during VHF voice communication.

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