

# DEVELOPING THE TOME C – TEST OF MARITIME ENGLISH COMPETENCE – TOWARD GLOBAL STANDARDIZATION OF MARITIME ENGLISH ASSESSMENT

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**Abstract** This paper is the first report of a joint project between the Tokyo University of Marine Science and Technology (TUMSAT) and the California Maritime Academy, a California State University (CMA) to develop a test of maritime English competence (TOME C) under a grant given to the TUMSAT by the Japanese Ministry of Education, Culture, Sports, Science and Technology to enhance the quality of Maritime English Education at the TUMSAT.

In order to properly assess each learner's competence in Maritime English as required by the STCW 95, the authors developed a multiple choice test that consists of five parts. The first three parts are for testing listening comprehension. Here test takers are required to choose one statement that best describes a picture, to find an appropriate answer to a question, and to answer a written question after listening to a conversation or an announcement. The last two parts are designed to assess learners' basic vocabulary and grammar, and reading comprehension. The principles in designing these items and what aspect of Maritime English is assessed by each part are discussed in detail.

We have prepared 2 versions for deck and 2 versions for engine cadets, each version or test consisting of 100 questions in total, the first three listening parts with 50, and

the remaining two parts with another 50 questions. Recordings were made in Japan by two professional narrators of British English.

What makes the present project so unique is the close collaboration between non-native, non-sea-going English teachers who are familiar with language testing on one hand and English speaking captain and chief engineer who are “living” Maritime English on the other. Only after such complimentary contribution can one expect a good test of Maritime English that is both reliable and valid.

Although the test was originally made to assess the effectiveness of the newly introduced maritime English courses at the TUMSAT, it certainly can be used to assess any person’s command of maritime English. The authors wish to further increase the number of exam items and to standardize different versions by giving the TOMECE to students studying at different IAMU member institutions.

## 0 Introduction

The TOMECE (Test of Maritime English Competence) reported here was developed to assess the effectiveness of newly introduced maritime English courses (Deck and Engine) at the Tokyo University of Marine Science and Technology (TUMSAT) under a grant from the Japanese Ministry of Education, Culture, Sports, Science and Technology.

Although there are standardized tests of business or academic English such as TOEIC, TOEFL, and IELTS, they are not designed to specifically assess maritime English competence. The ISF Marlins English Test, which measures English proficiency in maritime context, is commercially available, but it is computer based and thus not suitable for testing 35-40 students simultaneously in a classroom.

Our original goal is straightforward: to develop at least two sets of maritime English exam questions of approximately equal difficulty, so that we can give one set prior to, and the other set after, two semesters of maritime English courses in order to assess learners’ improvement. We opted for an audio tape/CD-based, paper and pencil, multiple-choice test for convenient administration and scoring. The test measures listening comprehension (Parts 1, 2, and 3) and basic grammar and vocabulary (Part 4), and reading comprehension (Part 5).

The TOMECE was designed to assess maritime English competence required by the STCW 95. Thus the deck department questions cover onboard, ship-to-ship, and ship-to-shore communications using the Standard Maritime Communication Phrases (but not exclusively so since the SMCP is a minimum requirement and real mariners, especially native speakers, do not necessarily communicate using them) and nautical publications such as sailing directions. The test for the engine department concentrates on ability to perform engineering duties and understand engineering publications such as manuals.

In preparing the test items, the third and fourth authors, who are English speaking captain and chief engineer, were responsible for the authenticity of maritime English and technical integrity for the listening comprehension questions. The first and second authors, who are non-native English teachers familiar with language testing, were responsible for the remaining

grammar/vocabulary and reading questions.

Ideally, recordings for listening questions should be made with various dialects of English, including non-native speakers with moderate accents because this is what mariners actually hear at sea. This option, however, was not possible, and the recordings were made in Japan by two professional narrators, who were both native speakers of British English.

In what follows, we will discuss each of the five parts of the test in detail using sample questions and conclude the paper with possible future directions toward global standardization of maritime English assessment.

## 1 Listening comprehension

The listening comprehension section of the test consists of three parts. The formats used here are similar to those found in the TOEIC test. In Part I, a statement that best describes a picture must be chosen among four statements. In Part II, a question or statement is played and test takers are to choose one of the four possible answers/responses to the question that are also aurally presented. In Part III, examinees listen to a conversation or announcement, and they are to answer a question written on the booklet.

### 1.1 Part I

Two sample questions (one for deck and the other for engine cadets) are presented below. For each question, the picture is printed in the test booklet in black and white, and four statements are aurally presented. The correct answer is printed in bold italics.



Fig. 1 Sample question 1



Fig. 2 Sample question 2

#### Sample question 1

- (A) The starboard anchor is currently deployed by the vessel.
- (B) The containership is fitted with a bulbous bow.
- (C) The gantry cranes are in operation.
- (D) The vessel is moored starboard side to the pier.

#### Sample question 2

- (A) The men are working on a part fixed with a vice.
- (B) The men are working on a lathe.
- (C) The men are fixing a vice onto the work bench.
- (D) The men are lapping in a valve.

The two examples above clearly show that this picture description format is suitable for testing listening comprehension of basic deck and engine related vocabulary items. These include nouns describing ship's nomenclature and engine room equipment and tool names (bulbous bow, starboard anchor, vice, lathe, etc.), verbs describing actions and conditions (to be deployed, to fix something with a vice, to lap in a valve, etc.). Although not presented in the above examples, Part I questions also test important adjectives (a taut/broken line, a frozen valve, etc.), and prepositions/prepositional phrases (X is behind/next to Y, moving forward/aft, etc.).

## **1.2 Part II**

In Part II, examinees listen to a question or statement followed by four possible answers/responses. They are to choose the best answer or response to the initial question or statement. Unlike in Part III, where questions and response alternatives are printed in the booklet, in Part II, both a question/statement and possible responses are presented aurally. Two sample questions will follow:

### **Sample question 3**

Who is responsible for securing the after hatch?

- (A) I will make a security call.
- (B) The hatch is secure.
- (C) The Bosun is responsible for the after hatch.
- (D) All the lines aft are secured.

### **Sample question 4**

At what time is finished with engines estimated?

- (A) We will start the engines at 0800.
- (B) Scheduled departure is in one hour.
- (C) By 1300 at the latest.
- (D) The engine maintenance will be finished at 1400.

As can be seen from the examples above, this part evaluates ability to understand a spoken message likely to be encountered onboard ship or in professional situations and to respond to it appropriately.

## **1.3 Part III**

In Part III, test takers listen to a conversation between two people or a statement by a single speaker, and answer a question written in the test booklet. Two sample questions will follow. The

recording scripts that are presented aurally appear in italics, followed by the questions and response alternatives printed in the test booklet.

### Sample question 5

Securite, Securite, Securite.

All ships in the Prince Rupert traffic lanes, the HMS Queen Victoria, call sign FTAK is proceeding southbound in Grenville channel with dangerous cargo. All vessels are instructed to

What is the nature of this communication?

(A) There is an aid to navigation malfunctioning.

(B) A man has fallen overboard.

keep a 500 meter precautionary zone around the vessel.

The next example is a conversation between a chief engineer and a third officer.

### Sample question 6

A: Bridge, this is the Chief Engineer.

B: Hi, Chief. This is the third officer.

A: Hi, John. Can we come to all stop to inspect a main bearing high temperature alarm?

B: Eh, it's really foggy and there are several danger targets. Can we just reduce speed for now?

A: OK. We will start reducing speed now.

B: Thanks, and I'll check with the Captain and get back to you.

What can be inferred from this conversation?

(A) The captain is likely to make a final decision as to when to stop the engine.

(B) They must stop the engine immediately or else the main bearing will seize.

Part III is suitable for testing ability to understand radio messages (e.g. Mayday, Securite, Pan Pan), ship-to-ship (e.g. making a passing arrangement), ship-to-shore (e.g. making a tug arrangement), and internal (e.g. bridge-engine room) communications.

## 2 Grammar/vocabulary (Part IV)

Part IV evaluates basic grammar and vocabulary. Since both "general" English and "maritime" English share a common grammar, successful communication depends on its sufficient knowledge. Any mariner should be able to understand the difference between "Starting air has run out." and "Starting air is running out." In order to express time sequence of events, one should be able to use conjunctions such as "before" and "after" properly. A coast guard vessel may "chase a pirate boat," but it is a completely different story if it "is being chased by a pirate boat." Thus, our grammar questions include tense, voice, proper use of different parts of speech, and function words such as conjunctions, prepositions, and auxiliary verbs.

Adequate knowledge of technical terms is also essential. Obviously, nouns form a central part of maritime vocabulary: pilot ladder, thruster, bearing, piston ring, main bearing, exhaust valve, etc. The list is almost endless. However, nouns alone do not make sentences. One must learn their collocations with other parts of speech such as verbs and adjectives: one “rigs” a pilot ladder, piston rings must be replaced when “worn”, and main bearings can “seize” if lube oil film is broken. Our test questions include those vocabulary items as well.

Two grammar-oriented sample questions are presented below. Examinees must choose one multiple choice item that best completes the sentence.

**Sample question 7**

Lube oil cannot be \_\_\_\_\_ its temperature is too low.

- (A) efficient filter if
- (B) efficiently filtered unless
- (C) efficiently filtered if
- (D) efficient filter unless

**Sample question 8**

The most critical time for preventing an accidental oil spill during bunkering is when the tanks \_\_\_\_\_.

- (A) are topping off
- (B) topped off
- (C) being topped off
- (D) are being topped off

The first question involves appropriate use of parts of speech and conjunctions, and the second one deals with tense and voice. Note here that grammar is tested in maritime contexts in the TOME. We now present two vocabulary-oriented sample questions:

**Sample question 9**

A vessel’s position should be plotted using bearings of \_\_\_\_\_ known objects on shore.

- (A) fixed
- (B) repaired
- (C) replaced
- (D) stored

**Sample question 10**

A properly adjusted \_\_\_\_\_ for an auxiliary boiler opens at its set pressure.

- (A) safety valve

- (B) maneuvering valve
- (C) butterfly valve
- (D) needle valve

The word “fixed” is not strictly maritime, but it is so in this particular context. The response alternatives for the last question consist of different valves, and to answer this question, one must know what these valves are. In this sense, this question presupposes a certain amount of technical knowledge, but we believe any chief engineer would expect his/her third engineer to know what a safety valve is.

### 3 Reading comprehension (Part V)

The last part of the test is designed to evaluate reading comprehension of practical materials that deck or engine cadets must read and understand such as sailing directions, international regulations and conventions, operation manuals, etc. After reading a passage, examinees are required to answer questions about its content. To save space, only one sample question for engine cadets is presented below:

#### Sample question 11

Read the following passages and answer the questions.

Misfiring may be rhythmical or erratic. The former indicates that the same cylinder(s) are misfiring all the time; the latter means that cylinders misfire randomly. Rhythmical misfiring is caused by a specific problem with one or more cylinders, such as low compression or faulty fuel injection. If it occurs on start-up then clears up once the engine warms, it is almost certainly due to low compression. The air in the cylinder is not initially reaching ignition temperature, but as the engine warms the air gets hotter until the cylinder fires.

The guilty cylinder(s) of a rhythmical misfire can be tracked down by loosening the injector nut on each injector in turn (with the engine running) until fuel spurts out. If the engine changes its note or slows down, the cylinder was firing as it should, and you can retighten

#### Q1

When an engine was lit off, misfiring at a regular interval was observed but it disappeared later. What is the most likely cause of this problem according to the passages above?

- (A) Faulty fuel injection.
- (B) Insufficient compression
- (C) Excessive fuel injection
- (D) Erratic ignition temperature

## Q2

How can one identify a misfiring cylinder according to the passages above?

- (A) By turning the injector while the engine is in operation.
- (B) By making sure that no fuel spurts out.
- (C) By shutting fuel supply to the cylinders one at a time.
- (D) By listening to the sound coming from each cylinder in turn.

Although choosing authentic reading materials seems reasonable, this indeed poses a challenge. If a test taker already knows what is being described in the reading material, he or she may be able to answer the questions without actually reading the passage. For example, presenting a passage referring to the maximum oil content allowed in bilge discharge and asking the maximum concentration would not work. To avoid this, we decided not to choose a reading material that may lead to questions that are too obvious.

## 4 Future goals

We believe that the sample questions presented here are enough to demonstrate the validity of the TOMEK test. It measures maritime English competence necessary for deck and engine cadets to perform their duties. Its reliability, however, must be tested empirically, and for that, we must give this test to as many students as possible, not only in Japan, but also in other countries.

For each department (i.e. Deck and Engine), we originally made two different versions of the TOMEK test, each consisting of 100 questions in total, with Part I through Part V consisting of 20, 20, 10, 30, and 20 questions respectively. We administered one version to junior-year deck students studying at the TUMSAT and found that these questions were too many for our 90-minute class. To make the test easier to administer in terms of its duration, we have decided to split each version into two equal halves, creating four versions that consist of 50 questions (25 listening, 15 grammar/vocabulary, 10 reading questions).

Our next step is to obtain sufficient data for equalizing the difficulty level among those versions. This process is also essential to obtain item discriminability and “weed out” inappropriate test items. To achieve this end, we would like to ask for IAMU members’ cooperation. Even though the test is not fully standardized yet, it can still be used for useful purposes. For example, it can be used as a screening tool. The test, if given to cadets newly admitted to an MET institution, will certainly teach them importance of learning maritime English. One can track their improvement by giving the same test just before graduation, proving the effectiveness of the Maritime English curriculum. So if any member institution is interested, please let us know. We would be happy to provide the test booklets, answer sheets, and scoring service. Confidentiality is guaranteed. The more data we have, the better the TOMEK becomes, and the member institutions can benefit from the test. We need your cooperation.

Using the test results, we will exclude test items with low discriminability, and create, hopefully, 3 versions that are approximately comparable. By giving these versions to English speaking cadets (seniors), we can estimate native speakers’ performance in terms of mean and standard deviation.

These parameters could be used to classify test takers level of Maritime English. For example, if a non-native examinee's score is above the mean, this would be classified as level A, within one standard deviation below the mean, level B, between one and two standard deviations below the mean, level C, and otherwise level D. A classification scheme like this would show each student how good their maritime English is compared to native speakers who are of equal academic standing (i.e. senior cadets).

The authors believe that the TOMECE test, when successfully completed, will provide MET institutions of the world with a convenient tool of evaluating maritime English competence as required by the STCW 95, and certainly work toward global standardization of maritime English assessment.