

ON THE NEW PILOT EDUCATION AND TRAINING SYSTEM IN JAPAN

Yoko Uchida, Hideo Yabuki And Naoyuki Takagi¹

ABSTRACT

In Japan, due to a significant reduction in number of Japanese flag oceangoing vessels and Japanese seafarers, a supply shortage of pilots is expected in the next several years to come. In order to maintain a constant supply of experienced pilots, the Japanese government has introduced a new education and training system for prospective pilots at designated maritime education and training institutions. As of April 2007, Tokyo University of Marine Science and Technology (TUMSAT) started a new pilot training program as one of its master's programs in its graduate school.

This article presents a summary of the newly-established education and training system for pilots in Japan and describes the curriculum for pilot training at TUMSAT which, as a new attempt, aims at training college graduates with limited sea experience.

I. INTRODUCTION

High quality pilot service for foreign oceangoing vessels that enter and depart from Japanese ports is indispensable for the prevention of marine casualties and pollution. In order to ensure safe vessel traffic in the Japanese territorial waters and ports, some 640 pilots are engaged in their service in 35 designated pilotage districts.

The career opportunity to become a pilot has long been open only to ex-masters with experience onboard oceangoing merchant ships, since the pilot certificate qualification requires a career history of having been onboard vessels of 3,000 G.T. or more for a period of 3 years or longer as a master. On the other hand, the Japanese flag vessels have recently experienced a drastic drop in number, which has led to an on-going decrease of ex-masters who satisfy the above-mentioned requirement. As shown in Fig 1, the recent number of Japanese oceangoing seafarers is about 3,000 and this figure is

¹ Tokyo University of Marine Science and Technology, Faculty of Marine Technology, 2-1-6 Etchujima, Koto-ku, Tokyo, 135-8533, Japan, uchidayo@kaiyodai.ac.jp

35% of the number of seafarers 10 years ago. Another problem is their aging: 35% of officers are aged 50 years or older, as is shown in Fig. 2. This being the case, a supply shortage of pilots is expected to take place in the next several years.

In order to keep a constant supply of experienced pilots, the Japanese government has introduced a new line of pilot certification system by training those who wish to become first-grade pilots (open to those with experience as a master), second-grade pilots (open to those with experience as a chief mate), and third-grade pilots (college graduates who hold the certificate of class III deck officer), at one of the maritime education and training institutions designated by the government.

As such an institution, Tokyo University of Marine Science and Technology (hereafter TUMSAT), as of April 2007, started a new pilot training program as one of its master’s programs under the Course of Maritime Technology and Logistics. The program is composed of a number of classroom lectures dealing with such topics as safety management for pilots, ship handling and Maritime English, as well as training sessions using the ship maneuvering simulator and onboard pilotage training directed by active pilots.

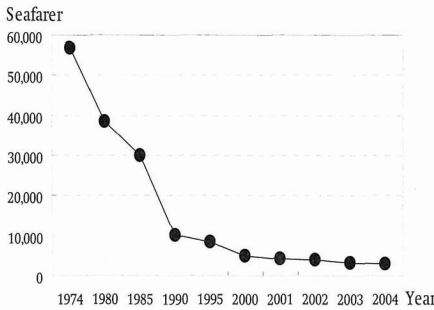


Fig. 1 Drastic drop in the number of Japanese seafarers

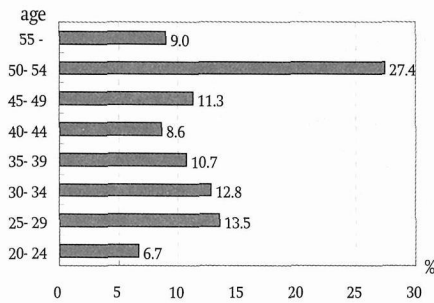


Fig. 2 Age distribution of officers

2. REFORM OF PILOT EDUCATION, TRAINING AND CERTIFICATION SYSTEM

In response to the possible shortage of pilots in the near future mentioned in the previous section, the Japanese government decided to modify the pilot certification system and put it into effect as of April, 2007, and concurrently to adopt a new pilot education and training system. This section describes this new pilot certification system and the new pilot education and training system.

2.1. PILOT CERTIFICATION SYSTEM

The former pilot certificate qualification required a career history of having been onboard vessels of 3,000 G.T. or more for a period of 3 years or longer as a master. However, considering the situation that the number of Japanese seafarers onboard oceangoing vessels is decreasing drastically (see Fig. 1), the qualification requirements for prospective pilots have been altered. Having experience as a master is not necessarily a prerequisite in the new certification system, which opens the opportunity for younger deck officers to become pilots, thus leading to a stable supply of pilots.

In accordance with the loosening of qualification requirements, three levels or “grades” have been introduced to the pilot certificate. The “grading” is based on the career history and qualifications (e.g., the holder of certificate of deck officer) of prospective pilots, and the size of vessels they can give service to also depends on the grades.

2.1.1. GRADE-BASED CERTIFICATION SYSTEM

The grade for which each applicant is eligible depends on his/her career history. 1st grade requires experience as a master as before, 2nd grade requires experience as a chief mate, and 3rd grade is open to college graduates who hold the certificate of class III deck officer.

2.1.2. GRADE-BASED QUALIFICATION REQUIREMENTS AND RANGE OF SERVICE

The grade-based qualification requirements and the range of service that a pilot can offer in terms of the vessel size for each grade are summarized in Table 1.

Table 1. Requirements of the pilots and their approved service range

	1st grade pilot	2nd grade pilot	3rd grade pilot
Certificate	Class III deck officer certificate holder		
Sea service experiences	Master 3,000 G.T. or more 2 years or more	Chief mate 3,000 G.T. or more 2 years or more	Cadet or officer 1,000 G.T. or more 1 year or more
Range of pilot service	None	not exceed 50,000 G.T. (Dangerous cargo ship ; not exceed 20,000 G.T.)	not exceed 20,000 G.T. (dangerous cargo ship handling not allowed)

Only masters are eligible for the 1st grade certificate. Sailing time required used to be 3 years, but it has been shortened to 2 years under the new system in view of the fact that masters now enter and leave ports more frequently due to increased vessel speed and shorter cargo work time in port. For the 2nd grade pilots, a career history of

having been onboard vessels of 3,000 G.T. or more for a period of 2 years or longer as a chief mate is necessary.

The size and cargo of vessels that can be served by a pilot is also limited according to the grade, since handling large ships or ships with dangerous cargo requires more experience: 2nd grade pilots are eligible for pilotage of vessels 50,000 G.T. or less (as for vessels with dangerous cargo, 20,000 G.T. or less); 3rd grade pilots are allowed to work onboard vessels 20,000 G.T. or less, and are not eligible for pilotage of vessels with dangerous cargo.

2.2. INTRODUCTION OF THE PILOT EDUCATION AND TRAINING PROGRAM

Following the loosening of qualification requirements, the level of knowledge and skills of pilots may be degraded. In order to prevent such an outcome, the government has established a new system of educating and training those who wish to become pilots at one of the three designated maritime education and training institutions. Under this system, there are two types of educational programs, one for newly-recruited pilots and the other for those who seek for a higher-grade certificate.

As for expenses to educate and train newly-recruited students, pilotage revenue is allocated, considering the significance of maintaining a sufficient number of pilots and providing high-quality pilot service.

2.2.1. STRUCTURE OF THE EDUCATION AND TRAINING PROGRAM

The following education and training is provided in the program. As for the period of education and training required for each grade and for each item, see Fig.3.

(1) Classroom lectures to obtain knowledge necessary for a pilot

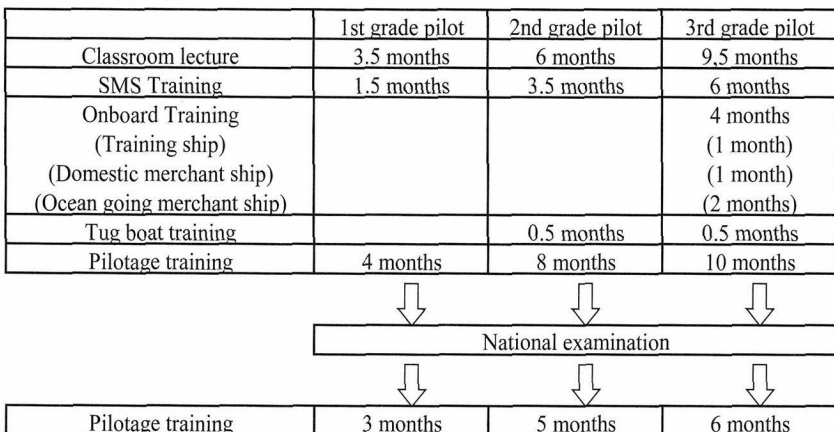


Fig.3 Duration of pilot education and training

- (2) Ship maneuvering simulator training (hereafter SMS training) to obtain practical skills
- (3) Training with tug boats which is used as a supplementary means of maneuvering
- (4) Training onboard merchant ships to experience maneuvering various ships
- (5) Practice of pilotage to obtain knowledge and skills necessary in actual pilot service (Additional training is mandatory after passing the national examination, as shown in the figure.)

2.2.2. OBTAINING A PILOT CERTIFICATE

Those who have completed the education and training program at one of the maritime education and training institutes designated by the government are eligible to take the pilot examination administered by the government, and by passing the examination, a pilot certificate is issued. Pilot examination consists of a physical test, a written examination, and an oral examination.

2nd grade and 3rd grade pilots are eligible to take an examination for a pilot certificate of a higher grade. Its prerequisite is experience of pilot work for a certain period of time following a completion of the education and training course at a maritime education and training institute. By passing the pilot examination, they are able to obtain a pilot certificate of a higher grade. Requirements and the procedure to obtain a pilot certificate of a higher grade are as shown in Fig. 4.

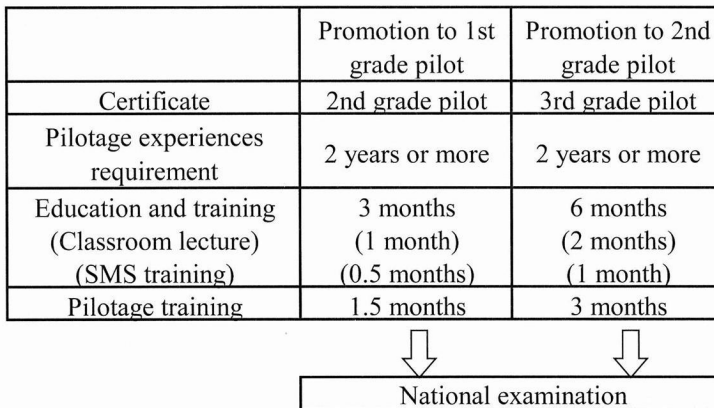


Fig.4 Promotion procedure

3. PILOT EDUCATION AND TRAINING COURSE AT TUMSAT

3.1. SUMMARY OF THE PROGRAM

Education and training of pilots at TUMSAT is implemented in its graduate school (Master's level), under the Course of Maritime Technology and Logistics. The pilot education and training course is comprised of classroom lectures, SMS training, tug boat training, training onboard various types of ships, and pilotage training, as shown in Fig.3.

The 3rd grade pilot course is two and a half years long. After 2 years of classroom lectures, SMS training, onboard training, as well as pilotage training for 4 months, as a fulltime graduate student, the students are allowed to take further pilotage training of 6 months as a credited auditor, upon completion of which they are entitled to take the pilot examination. In addition to the course requirements, students of the 3rd grade pilot course must write a Master's thesis. After a successful submission and defense of the thesis, they are awarded the Master's Degree (Engineering).

The 2nd grade pilot course, open to those with experience as a first mate, is a year and a half long. It is obligatory for the students to spend their first 10 months taking 6 months of classroom lectures, SMS training, and tug boat training. This is followed by pilotage training for 8 months, upon completion of which they are entitled to take the pilot examination.

The 1st grade pilot course, open to those with experience as a master, is 9 months long. After fulfilling requirements of classroom lectures and SMS training which last for 5 months and 4 months of pilotage training, they become eligible for the pilot examination.

3.2. CURRICULUM OF THE 3RD GRADE PILOT COURSE

Table 2 shows the curriculum of the 3rd Grade Pilot Course, designed to train and educate newly-recruited college graduates.

Classroom lectures consist of 13 subjects (26 credits) that are relevant to navigation, ship maneuvering, maritime traffic laws. Special emphasis is placed on practical Maritime English necessary for pilots onboard foreign vessels. In addition to providing a broad knowledge essential to pilots, advanced theories and achievements of the past research on ship navigation are introduced and taught.

SMS training comprised of six subjects (6 credits) is a core basis of the technical education. Active pilots with abundant experience are invited as instructors and lead the class, using a full-mission ship maneuvering simulator that has been newly installed for the training. Training sessions include passage navigation under various conditions

such as strong wind and restricted visibility; docking and undocking practice; BRM (bridge resource management) training; and communication training in English.

Table 2. Curriculum for 3rd grade pilot

Classroom lectures		Training	
Subject	Credit	Subject	Credit
Route planning	2	SMS Training	6
Navigation engineering	2	Onboard Training	5
Mobile communication system	2	(training ship)	(1)
Advanced navigation information	2	(Domestic merchant ship)	(1)
Navigation performance	2	(Ocean going merchant ship)	(2)
Design on shiphandling system	2	(Tug boat)	(1)
Stochastic analysis of ship motion	2	Pilotage Training	9
International safety management at sea	2		
Environmental predictions	2		
Safety management of pilotage	2		
Maritime traffic law	2		
Health care and marine	2		
Advanced maritime English	2		
Research (master's thesis)	8		

Repetitive onboard training of passage navigation as well as docking and undocking practice in Tokyo Bay is conducted using the university training ship, Shioji-maru. Appropriate use of tugboats as a supplementary means of shiphandling at the time of docking and undocking is taught through the tugboat training. Training onboard merchant ships allows students with limited practical experience as a navigation officer onboard merchant ships to experience navigational watch, passage navigation, as well as docking and undocking in both domestic and international waters and ports under various vessel traffic environments. This training enables them to attain a better understanding of the actual navigation circumstances. Both oceangoing merchant ships and domestic merchant ships are used for this training.

Pilotage training is aimed at having the students learn the work procedure and practices of a pilot, and therefore, the training takes place onboard an actual ship, under the instruction and supervision of an active pilot in the pilotage district where the students will be working in the future.

The milestones of education and training based on the curriculum is shown in Fig. 5.

The education and training of 3rd grade pilots, which lasts for two and a half years, are divided into five semesters. In Semester 1, SMS training is carried out along with classroom lectures, and at the end of the semester, ship-maneuvering training using the university training ship is given followed by training onboard domestic merchant ships. Classroom lectures and SMS training are continually given in Semester 2, at the end of which training onboard oceangoing merchant ships is given. Students start to work on a research topic of their own choice for their master's thesis in Semester 3. At the beginning of this semester, students also go through tug boat training, followed by 2 months of practice of pilotage.

Items	Duration (months)	Semester 1	Semester 2	Semester 3	Semester 4	Semester 5
Classroom lecture	9,5	↔	↔	↔	↔	
SMS Training	6	↔	↔	↔	↔	
Onboard Training (Training ship)	4 (1)	↔				
(Domestic merchant ship)	(1)	↔				
(Ocean going merchant ship)	(2)		↔			
Tug boat training	0.5			↔		
Pilotage training	10			↔	↔	↔
Research (master's thesis)		←	→	→	→

↑
Graduation

Fig. 5 Education and training milestone for 3rd grade pilot

With this experience, they have practical SMS training while having classroom lectures at the same time. In Semester 4, after 2 months of pilotage training, further practical SMS training is provided. In addition, it is required that each student finishes comes his/her thesis and defends it at the end of the semester.

After having been awarded the Master’s Degree Semester 5 comes. This semester is entirely devoted to pilotage training, which lasts for 6 months.

4. SUMMARY

We have given an overview of a newly established pilot education system in Japan, and have described the pilot education and training program at TUMSAT.

Peculiar to this new system is the attempt to educate and train, as 3rd grade pilots, college graduates who do not have any experience as deck officers onboard merchant ships. Since the majority of pilots are eventually expected to be 3rd and higher grade pilots who have been trained under this new system, it would not be too much to say that the safety of the Japanese territorial waters and harbors rests on the quality of the pilot education and training at our institution.

Advanced theories and new research findings on navigation and maneuvering can be taught through classroom lectures while technical mastery of maneuvering is attained through the SMS training and the practical training onboard the university training ship and merchant vessels. In doing so, cooperation of our institution and active pilots is essential. Making the best use of feedback and advice offered by experienced pilots during both SMS and onboard training, we hope to provide our students with the best education and training possible where theory and practice complement each other, thus producing a number of intelligent pilots with a Master’s Degree (Engineering).