Outline of "The Welding Technology Training Center"

1. Introduction

Welding engineer training at Nippon Steel began in 1970 when the company setup a welding training center in the former Technology Research Lab-II at the same time that the welding center (the present Welding Research Center) was expanded and upgraded. Initially, systematic training and fostering of welding engineers was the primary aim of the welding training center. However, in 1983, the content of the training was drastically changed and the main emphasis was shifted toward technical services to support sales activities. At the same time, the company opened training courses developed mainly for its customers. In 1991, the welding training center was renamed to the Welding Technology Training Center. In order for the new training center to provide more substantial training in cooperation with related departments within the General Technology Center, the training center was moved to Futtsu City, Chiba Prefecture in 1992. Since then, the center has carried out various new activities.

Armed with the company's accumulated assets of know-how and state-of-the-art technologies as the fruit of its R&D into welding, metallic materials, welding materials, new welding techniques, etc., the Welding Technology Training Center now offers higher levels of training in the latest welding technology and techniques, and provides various consulting services relating to welding.

The basic policies regarding the Center's activities are: (1) Help boost the sales of steel products of the Nippon Steel Group and provide support to sales activities of the Engineering Division through training and consultancy in welding; and (2) Implement training and guidance in systematic welding technology based on the needs of the company, its affiliates and its customers. Specifically, the Center helps develop new markets for plates, sheets, pipes, stainless steels and other steel products and titanium; supports the company's engineering businesses, including construction of pipelines and buildings; provides the company's customers at home and abroad with technical services and training in welding technology; and offers various consulting services in welding technology, etc.

Fig. 1 shows the cumulative number of trainees since the inauguration of the Center, and **Fig. 2** shows the year-by-year transition in the number of trainees. The cumulative number of trainees exceeded 10,000 in 1994 and 16,000 in 2004.

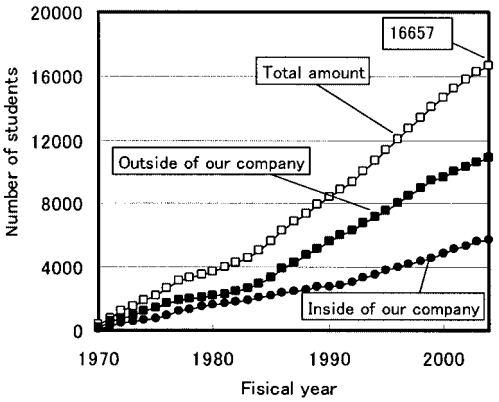

Fig. 1 Total amount of students

2. Organization and Equipment

The Welding Technology Training Center, under the auspices of the Steel Research Institute of the Technology Development Division, engages in the training and consulting businesses with the cooperation of the Welding Research Center, various research departments and related departments of the company and the member companies of the Nippon Steel Group, including Nippon Steel Welding Products & Engineering Co., Ltd., Sunwel Techno Service Co., Ltd. and Nittetsu Techno Research. The Center invites special lecturers from various research departments and related departments when the trainees require especially sophisticated content or expert knowledge in specific fields.

The Center, which is located on the quasi-ground facing the west gate of the General Technology Center, has a 30-seat classroom, a combination classroom and laboratory that can accommodate 20 train-

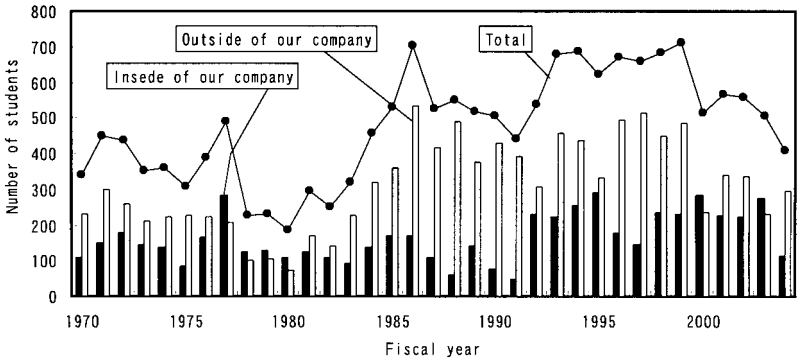

Fig. 2 Number of students for each year

ees, a 40-seat training room, an office room and an annex to the Center. The training room is equipped with 25 hand welders (includes 20 TIG welders), 19 semi-automatic welders, various types of welding devices, and bending test apparatus, etc. The combination classroom and laboratory is equipped with detectors for ultrasonic and magnetic flaws, hardness testers, optical microscopes, and welding data collecting equipment, etc. which are used for training purposes. The Center uses an electron microscope, tensile tester, impact tester, and various types of analyzers, and the like installed in the General Technology Center when needed to conduct sophisticated R&D. This includes the testing of welded joints.

3. Training Content

As shown in **Table 1**, the training consists mainly of (1) technical courses (experience in welding; introductory; advanced; WES Classes 1 & 2; stainless steels) and skill courses (primary training of welding engineers; JIS qualification examination), which are both planned on an annual basis, and (2) extraordinary courses on an "on request" basis from customers. Special courses cover a wide range of subjects, from basic welding technology, on-site welding and welded joint testing to support for development to consultancy about welding. If trainees request, a specific training plan is developed to conduct a suitable course based on those plans. Such courses may also be held at the customer's site (lectures/technical diagnosis) or within the Center.

4. Status of Recent Activities

In 2004, 179 people attended technology/skill courses and 58 extraordinary/consulting courses (includes 4 cases in which lecturers, etc. were dispatched to outside societies or associations).

Fig. 3 shows the breakdown by subject, of extraordinary/consulting courses attended by member companies of the Nippon Steel Group: Engineering Division (present Nippon Steel Engineering Co., Ltd.), with 19; Titanium Division, with 5; Nippon Steel & Sumikin Stainless Steel Co., Ltd, with 7; Technology Development Division, with 4; Sunwel Techno Service Co., Ltd., with 3; Nittetsu Techno Research, with 2; and Nippon Steel Headquarters, with 1. The courses cover: attendance at execution/testing and guidance in welding technology in pipeline/building construction projects; guidance in welding technology to promote sales of stainless steel/titanium products; experimentation on welding and analysis as part of R&D; applied engineering courses and guidance in welding competitions offered

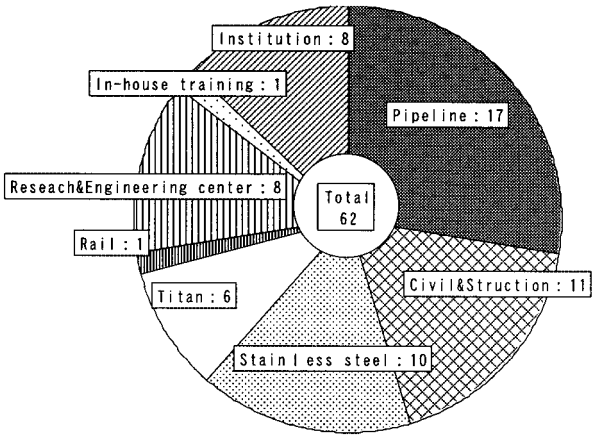

Fig. 3 Number of special course (2004 fiscal year)

Fig. 4 Lecture scene (outside of our company)

Fig. 5 Practice scene

Table 1 Contents of welding training and welding consulting

Each course		Execution situation			Purpose	Content
		Frequency /year	Days /time	Capacity		
Technological course	Beginner's class	3	5	30	Practicing acquisition of welding base technology	Lecture of welding, and practice
	Higher rank's class	1	3	30	Practicing acquisition of welding application technology	Lecture of welding technology, and experiment and demonstration
	WES class	2	5	30	Preparation for the WES qualification acquisition	Lecture of welding, and mock subject examination
	Stainless steel class	2	3 or 5	30	Acquisition of basic technology of stainless steel welding and improvement of skill	Lecture, and experience practice and demonstration
Skill course	Welding person	1	5	30	Welding skill guidance of new figure	Lecture of welding, and Practice training
	JIS examination	2	5	30	The examination of JIS welding technology certificate examination	Practice training with test specimen and acquisition of judgment standard
Special course	Special course & consulting	The content of execution will be consulted and be decided the request origin.				

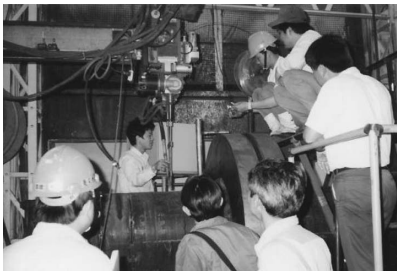

Fig. 6 Consulting scene (outside of our company)

to young employees; etc. The Center has also provided training in welding technology in China and Taiwan and is ready to provide such training in other countries.

The Center intends to continue supporting the company’s sales activities by providing training in welding technology and looks forward to contributing to the development of society by fostering welding engineers and helping customers to improve their welding skills.

For further information, contact
Welding Technology Training Center,
Steel Research Institute