MECH4950
(Advanced Manufacturing in Practice)

THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

Agenda for MECH4950 information seminar on Tue 3rd Sept 2024@ 50-C207

15:00 Administrative info (Ms Minami Yoshida)

15:10 Overview and past experiences of MECH4950 (Prof. Kazuhiro Nogita)

10:50 Q&A

MECH4950
(Advanced Manufacturing in Practice)

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New Colombo Plan Mobility Program 2024

Hydrogen Energy in Australia and Japan

- Industry Opportunities for Australia's Future Engineers -

20 students to participate in the short-term mobility program to Japan (21st Nov to 7th Dec 2024).

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Project Aims

- To provide an opportunity for 22 UQ Engineering students
- The project will consist of 20 days stay.
- The project will involve on-site exchange to Kyushu University (KU) and the delivery of two series of lectures.
- Lecture topics will include Advanced Engineering Technologies with a focus on the Japanese Manufacturing Sector and Japanese Language.
- The Kyushu Economic Federation (KEF) and Fukuoka Strategy Conference for Hydrogen Energy (FSCHE) will facilitate industry involvement and the participation of manufacturing facilities (Nippon Steel, Kyushu Electric Power Co, Namura Shipbuilding Co., HyTReC, J-POWER etc.).

MECH4950 in 2024
(Advanced Manufacturing in Practice)

THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

Professor Kazuhiro Nogita

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Personal Link http://nihonsuperior.mechmining.uq.edu.au/our-people
Notes
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Personal Link https://researchers.uq.edu.au/researcher/28208

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Administrative Officer

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MECH4950 in 2022 (Advanced Manufacturing in Practice)

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Date	Activity	Learning Objectives
26 Nov 22 8:40 - 11 Dec 22 10:00	**Kyushu Uni (Fukuoka) (International workshop and tour):** The full schedule will be available on Blackboard. **Readings/Ref:** Blackboard; UQSafe	1, 2, 3

Assessment Task	Due Date	Weighting	Learning Objectives
Report Final Report	17:00 on Monday 19 December 2022	60%	1, 2, 3
Presentation Summary Presentation	5:00pm - 6:20pm 9 December 2022	40%	1, 2, 3

+ Group Presentation @ KU, and essay for NCP (1-2 pages with photos)

MECH4950 in 2022 (Advanced Manufacturing in Practice)

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NCP presentation 5:00pm to 6:20pm on Friday 9th Dec 2022 @ Kyushu Uni

Assessor's name:

Presentation Assessment Sheet (MECH4950) Signature:

Group	Group Members	Total (100)	Depth of analysis and demonstration of key concepts and ideas (50)	Structure and timing (15)	Presentation (voice, professionalism, audio-visual, mannerisms) (15)	Handling of questions demonstrates depth of knowledge (20)
1						
2						
3						
4						
5						

MECH4950 in 2022
(Advanced Manufacturing in Practice)

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Mark sheet: MECH4950 report (Page 1)

Student Name:			**Student Number:**		**Marker:**	
Grade Band	**Definition and scope (10%)**		**Background (20%)**		**Evaluation of Manufacturing in Japan and Academic and Professional Engineering Practice (50%)**	
Excellent (85-100%)	Excellent, clear definition of the topic and scope. A suitable abstract that accurately yet concisely captures the topic and outcomes of the NCP travel.	10 9	Extensive, relevant and logically organised review, analysis, discussion of background material. Both specific research and general theory, helps the reader understand the rest of the document. Demonstrates clear mastery of the material in the topic area and ability to synthesize and abstract knowledge.	20 18 17	Excellent synthesis of background material and ideas and learning that occurred during the NCP travel to evaluate the key concepts outlined in the learning objectives. There is a clear depth to the report that demonstrates the creation and/or comparison of ideas in a concise fashion.	50 46 43
Very Good (75-84%)	Very good definition of the topic and scope. The abstract accurately captures the topic, and outcomes of the NCP travel.	8	Relevant and logically organised review, analysis, discussion of background material. Both specific research and general theory, helps the reader understand the rest of the document. Demonstrates mastery of the material in the topic area and ability to synthesize and abstract knowledge.	16 15	Very good synthesis of background material and ideas and learning that occurred during the NCP travel to evaluate the key concepts outlined in the learning objectives. There is a depth to the report that demonstrates the creation and/or comparison of ideas.	42 40 38
Good (65-74%)	Good definition of the topic and scope. The abstract captures the topic and outcomes of the NCP travel.	7	Good review/discussion of background material. Both specific research and general theory are presented. Shows good understanding of the material in the topic area and ability to synthesize and abstract knowledge.	14 13	A good synthesis of background material and ideas and learning that occurred during the NCP travel to evaluate the key concepts outlined in the learning objectives. There is some depth to the report that demonstrates the creation and/or comparison of ideas.	37 35 33
Satisfactory (50-64%)	Satisfactory definition of topic and scope. The abstract satisfactorily captures the topic and outcomes of the NCP travel.	6 5	Acceptable coverage of background material. Both specific research and general theory are presented. Shows basic understanding of the material in the topic area.	12 11 10	A satisfactory synthesis of background material and ideas and learning that occurred during the NCP travel to evaluate the key concepts outlined in the learning objectives.	32 28 25
Poor (25-49%)	Poor or incomplete definition of topic and scope. The abstract is not clear about the topic and the outcomes of the NCP travel.	4 3	A limited coverage of background material, which perhaps does not cover both specific research and general theory. Flaws in the basic understanding of the material in the topic area are evident.	9 8 7 6 5	A poor attempt has been made at synthesising the background material and ideas and learning that occurred during the NCP travel to evaluate the key concepts outlined in the learning objectives. The report is more a chronological account of the trip with little evidence that new ideas were considered/generated.	24 22 18 15 13
Very Poor (0-24%)	Topic and scope are very unclear. The abstract does not summarise the report topic and outcomes or there is no abstract.	2 1 0	An extremely limited coverage of background material is included. There is an apparent lack of understanding of the material in the topic area.	4 2 0	Limited or no connection is evident between the background material and ideas and learning that occurred during the NCP travel to evaluate the key concepts outlined in the learning objectives.	12 6 0

Report due at 5:00pm on Monday 19th Dec 2020 via Blackboard

NCP 2017-2023

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AUSTRALIA

BRIDGESTONE
Your Journey, Our Passion

NIPPON STEEL

J-POWER

TOTO

HITACHI
Inspire the Next

九州大学
KYUSHU

Mitsubishi UBE Cement Corporation

YASKAWA

LEXUS

株式会社 名村造船所
NAMURA SHIPBUILDING CO.,LTD.

MITSUBISHI ELECTRIC

SUMCO

MITSUBISHI HEAVY INDUSTRIES

Kitakyushu 北九州
Fukuoka 福岡
Saga 佐賀
Kurume 久留米
Beppu 別府
Oita 大分
Omuta 大牟田
Kumamoto 熊本
Takachiho 高千穂町
Nobeoka 延岡
Saiki 佐伯
Nagasaki
OITA
NAGASAKI
KUMAMOTO

Kyushu region of Japan and the current prefectures on the island of Kyushu

MECH4950 in 2022
(Advanced Manufacturing in Practice)

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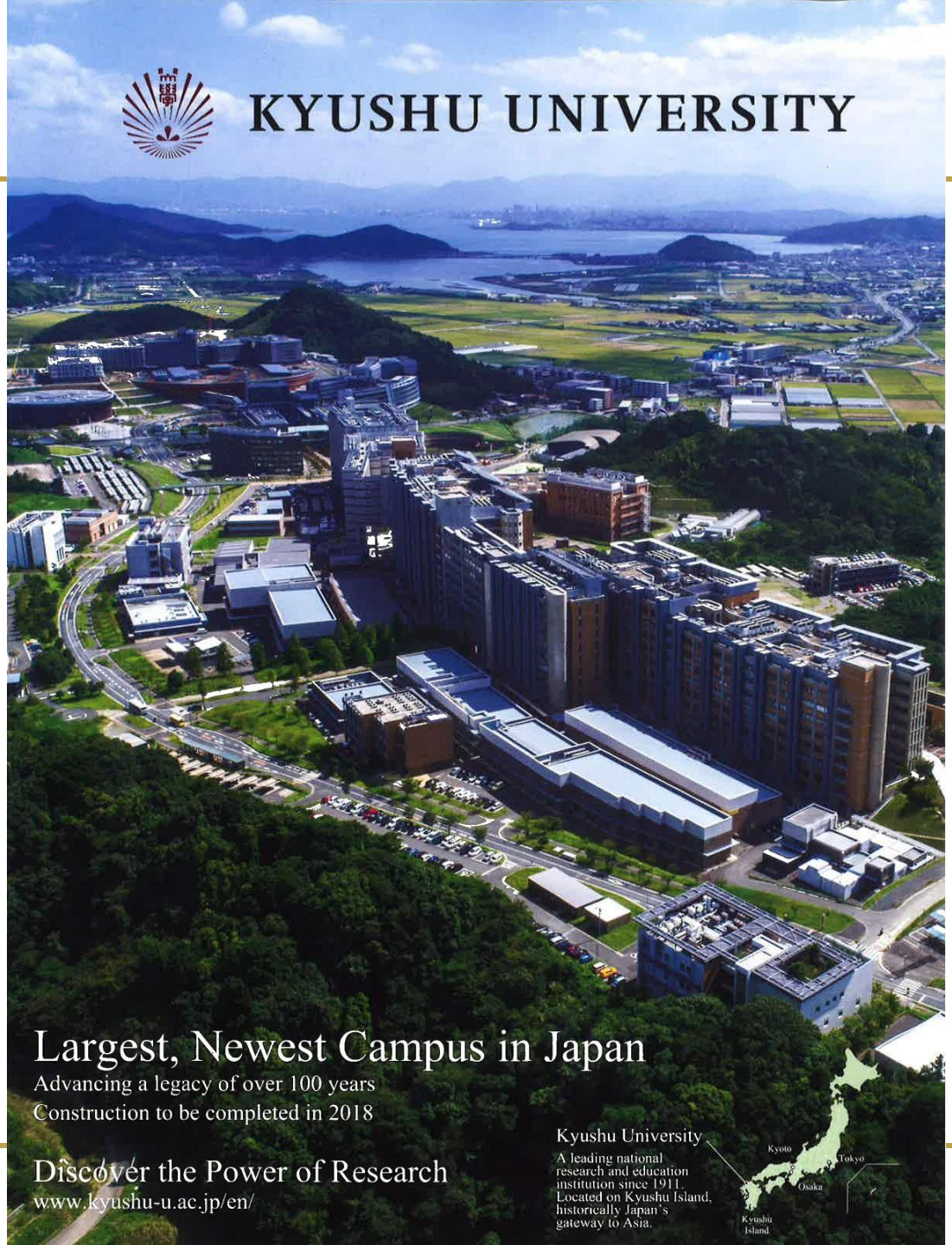
2022 UQ-JPIE (Japan Program for Industry Experience) ※Tentative

As of 12/13/2022

	28 November (Mon)	29 November (Tue)	30 November (Wed)	1 December (Thu)	2 December (Fri)	3 December (Sat)	4 December (Sun)
08:40-10:10		WLR① (Steel) 【W4,#420 Meeting Room 1】 Prof.Ko-ichiro Ohno /Prof. Masaki Tanaka 9:00-10:30	Factory Tour NIPPON STEEL CORPORATION 10:00-12:00 Hibikinada area demonstration field Support: Kitakyushu Power Co., Ltd. 14:00-14:45	WLR③ (Naval Architecture and Ocean Engineering) 【W4,#420 Meeting Room 1】 Prof. Koji Gotoh	Factory Tour Fukuoka City Chu-bu sewage treatment center & Hydrogen Station 10:00-12:00 HyTReC 15:00-17:00	Free time	Free time
10:30-12:00	Opening Ceremony 11:00-11:30 【Nakayama Hall,Jonathan KS Choi Cultural Centre of Japan】 Lunch Time 11:45-12:45 【Nakayama Hall,Jonathan KS Choi Cultural Centre of Japan】	LT① (Steel) Prof. Masaki Tanaka / Prof.Ko-ichiro Ohno 10:30-12:00		WLR④ (Earth Resources Engineering) 【W4,#420 Meeting Room 1】 Associate Professor. Takashi Sasaoka			
12:00-13:00		Lunch Time		Lunch Time			
13:00-14:30	Plenary Lecture 13:15-14:15 <Mr. Trevor Holloway> Australian Consul-General in Osaka 【Multipurpose Hall, Guest House】	WLR② (OPERA) Prof. Chihaya Adachi 【Room: COI Seminar Room No.332】 13:30-15:00		Japanese Industries ① 【W4,#420 Meeting Room 1】 Prof. Masamichi Kohno			
14:50-16:20	Orientation 14:30-14:45 【Multipurpose Hall, Guest House】 Campus tour with KU students 14:45-16:20 【Multipurpose Hall, Guest House】	LT ② (OPERA) Prof. Chihaya Adachi 15:00-16:00					
16:40-18:10	Meeting with the KU buddy 【W4, Information Study Room 1】 16:40-18:10						

	5 December (Mon)	6 December (Tue)	7 December (Wed)	8 December (Thu)	9 December (Fri)	10 December (Sat)	11 December (Sun)
08:40-10:10	Japanese Industries ② 【W4,#420 Meeting Room 1】 Prof. Schröder Martin	Factory Tour Kyushu Electric Power Co., Inc. 10:00-12:00 Namura Shipbuilding Co., Ltd. 14:30-16:30	WLR⑥ (Robotics) 【W3,#415 Meeting Room 2】 Prof. Kazuo Kiguchi	JBC① 【W4,#420 Meeting Room 1】 Prof. Natalie Konomi	WLR⑧ (Research Institute of Advanced Electric Propulsion Aircrafts) 【W2,#617,Seminar room】 Prof.Hiroshi Miyazaki Assoc. Prof. Andreas Themelis	Free time Transport to Fukuoka airport	
10:30-12:00			LT ④ (Robotics) Prof. Kazuo Kiguchi 10:30-11:30	WLR⑦ (Ultramicroscopy Research Center) 【W4,#420 Meeting Room 1】 Prof. Kazuhiro Yasuda	LT ⑧ (Research Institute of Advanced Electric Propulsion Aircrafts) Prof.Hiroshi Miyazaki Assoc. Prof. Andreas Themelis		
12:00-13:00	Lunch Time		Lunch Time	Lunch Time	Lunch Time		
13:00-14:30	WLR⑤ (I2CNER) 【I2CNER Conference Room 217・218】 Assoc. Prof. Aleksandar Staykov 13:30-15:00		LT⑤ (Wind Tunnel) Associate Professor. Hideaki Ogawa 13:00-13:30	LT⑥ (Hydrogen Station HY30) 13:30-14:30	JBC② 【W4,#420 Meeting Room 1】 Prof. Natalie Konomi		
14:50-16:20	LT③ (I2CNER) Assoc. Prof. Aleksandar Staykov 15:00-15:45			LT ⑦ (Ultramicroscopy Research Center) Prof. Kazuhiro Yasuda			
16:40-18:10	Tea Ceremony club ※Tentative			Calligraphy club (Extracurricular Activities Facility Ⅱ Japanese-style room) 17:00-18:00	UQ-KU Workshop & Closing Ceremony 17:00-18:20 【Shikihall Lecture Room 2】 Farewell Party 18:30-20:00 【Iri-to Restaurant】		

ERC : Engineering Course				
WLR: World-leading Research Hydrogen, Wind, Nuclear Energy	LT: Lab Tour	Japanese Industries	JBC: Japanese Business Communication	Plenary Lecture



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https://www.youtube.com/watch?time_continue=148&v=6V8Ib77rp8s

Engineering Education at Kyushu University

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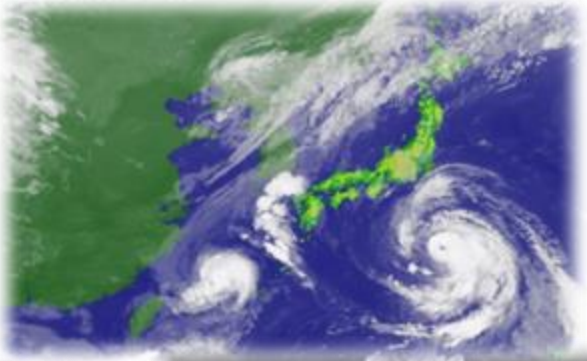

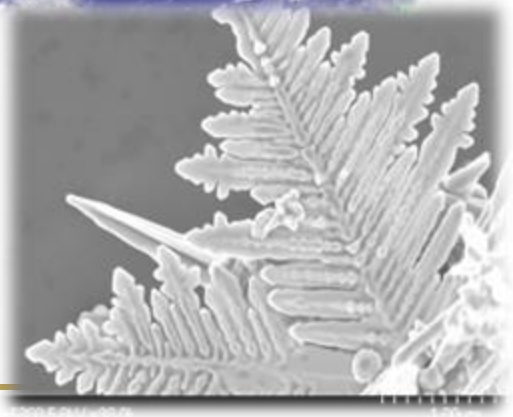

Buddy system at Kyushu University

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Kyushu University Shodo club

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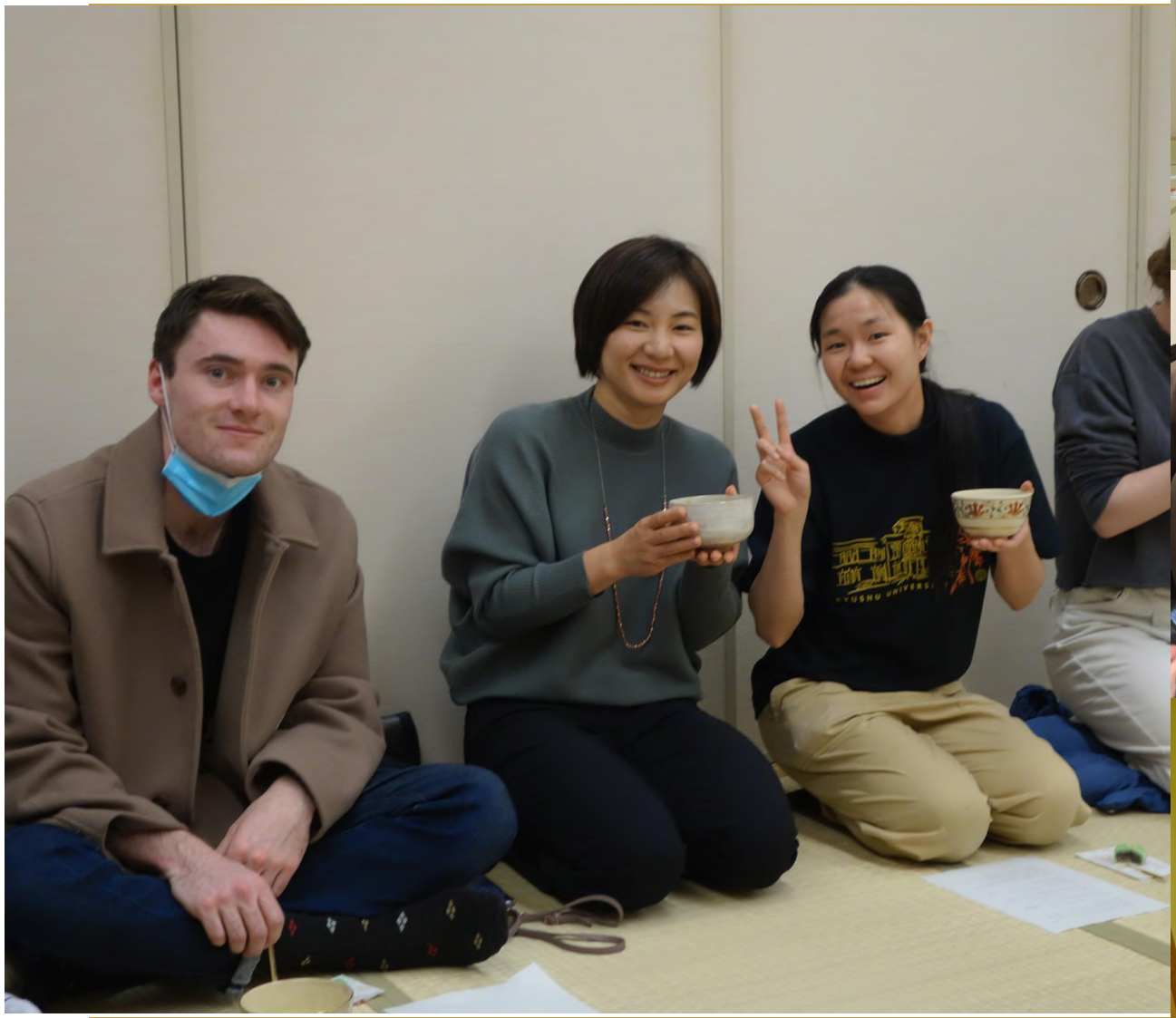
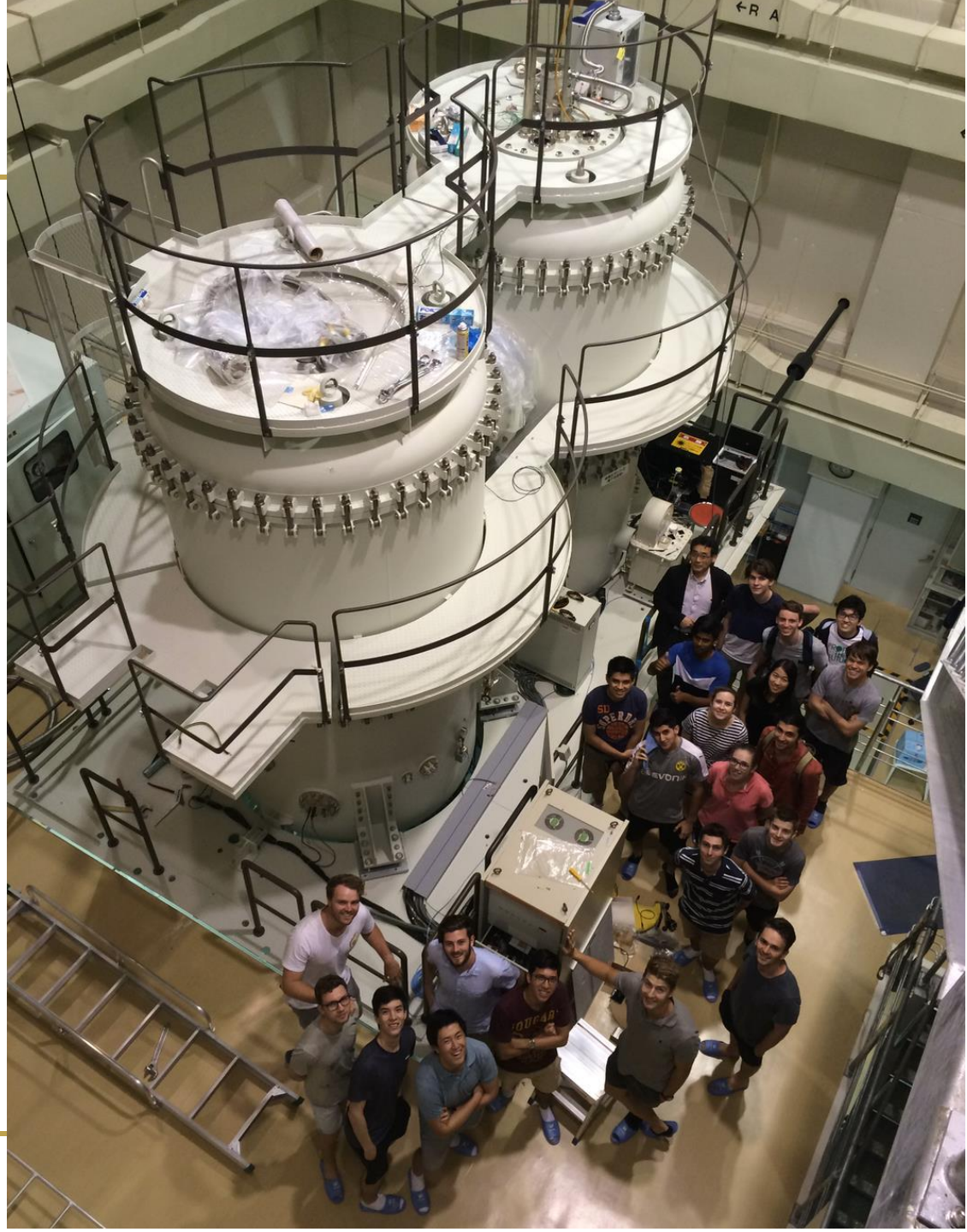
Kyushu University Tea Ceremony Club



World-leading Research
OPERA

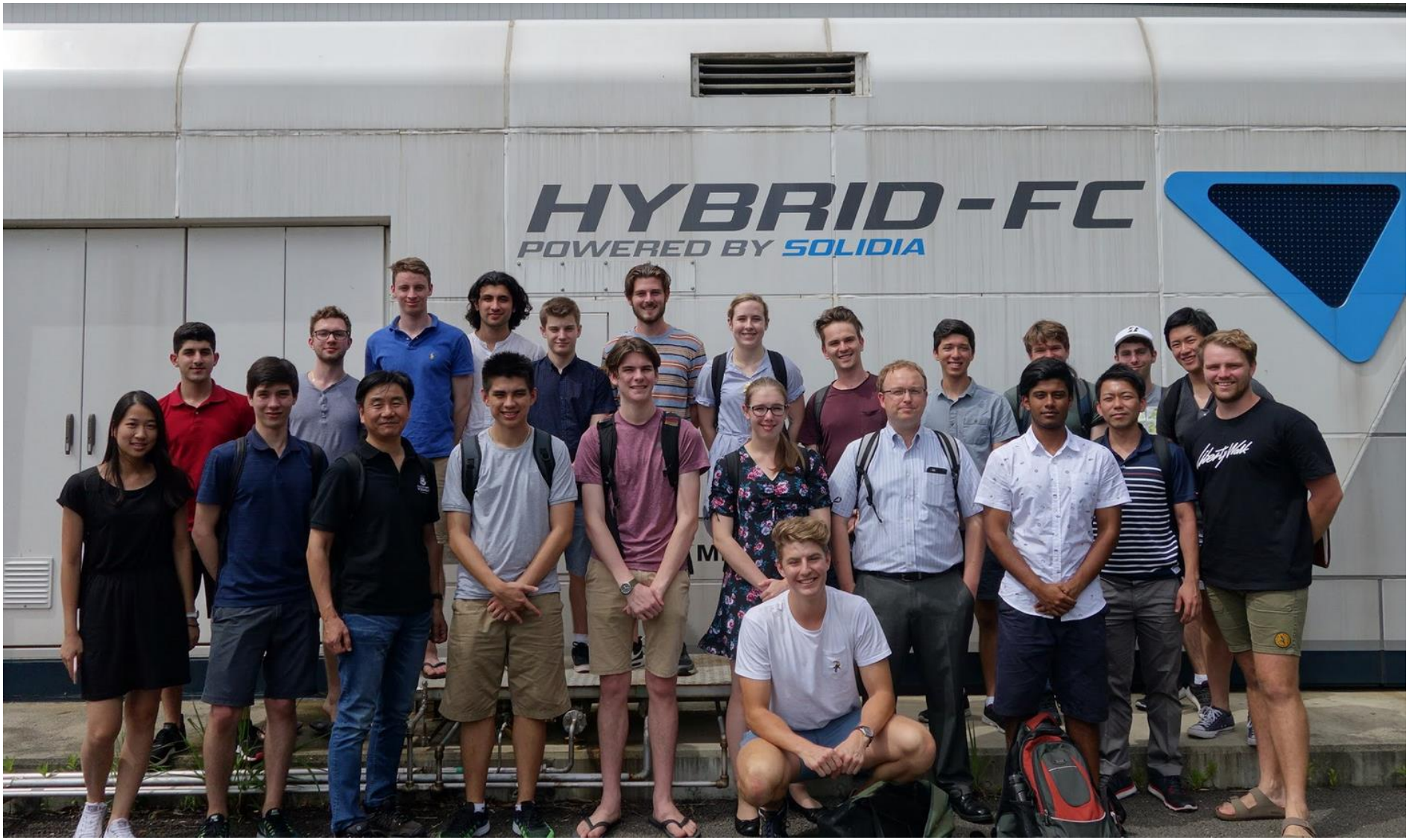
Prof. Chihaya Adachi

World-leading Research
The Ultramicroscopy Research Center



Prof. Kazuhiro Yasuda

World-leading Research
I2CNER



Prof. Stephen M. Lyth

World-leading Research
Recent study on the Space Transportation System

Prof. Hideaki Ogawa

九州大学
KYUSHU

Mr Jackson Geritz (UQ Racing Team) with Hydrogen

HyTReC (The Hydrogen Testing and Research Center)

https://www.hytrec.jp/pdf/hytrecEnglish.pdf

HyTReC (The Hydrogen Testing and Research Center)

https://www.hytrec.jp/pdf/hytrecEnglish.pdf

Genkai Nuclear Power Station (Genkai Energy Park)

https://www.kyuden.co.jp/english_index.html

Genkai Nuclear Power Station (Genkai Energy Park)

https://www.kyuden.co.jp/english_index.html

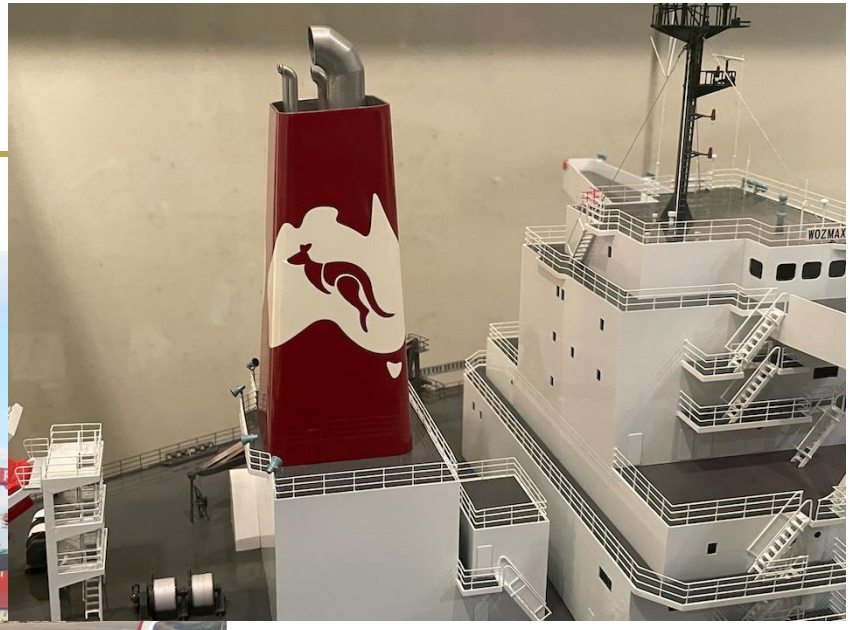
Genkai Nuclear Power Station (Genkai Energy Park)

https://www.kyuden.co.jp/english_index.html

Namura Shipbuilding Co.

https://www.namura.co.jp/en/index.html

Namura Shipbuilding Co.



https://www.namura.co.jp/en/index.html

Namura Shipbuilding Co.

https://www.namura.co.jp/en/index.html

MUCC

Mitsubishi UBE Cement Corporation

Industries in North Kyushu Island

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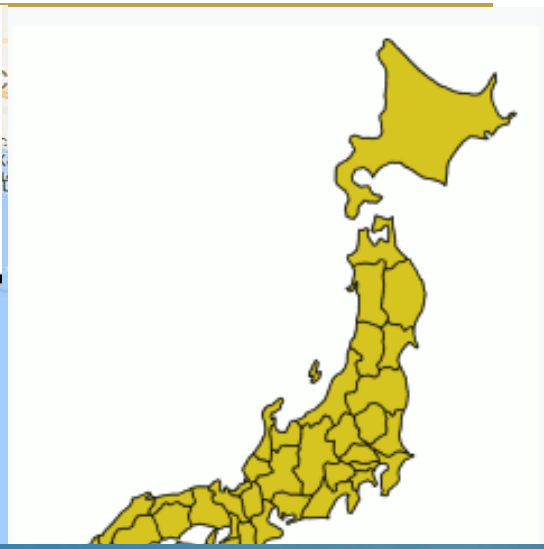
NIPPON STEEL



Becoming the Best Steelmaker with World-Leading Capabilities

NSSMC has adopted a new medium-term business plan, covering fiscal 2018 to 2020. By improving the company's "technology," "cost," and "being global" characteristics, NSSMC is determined to prevail in the increasingly competitive market. The company has every intention of becoming the unrivaled Best Steelmaker.

Scroll

NSSMC and Nisshin Steel's Joint Statement

NIPPON STEEL

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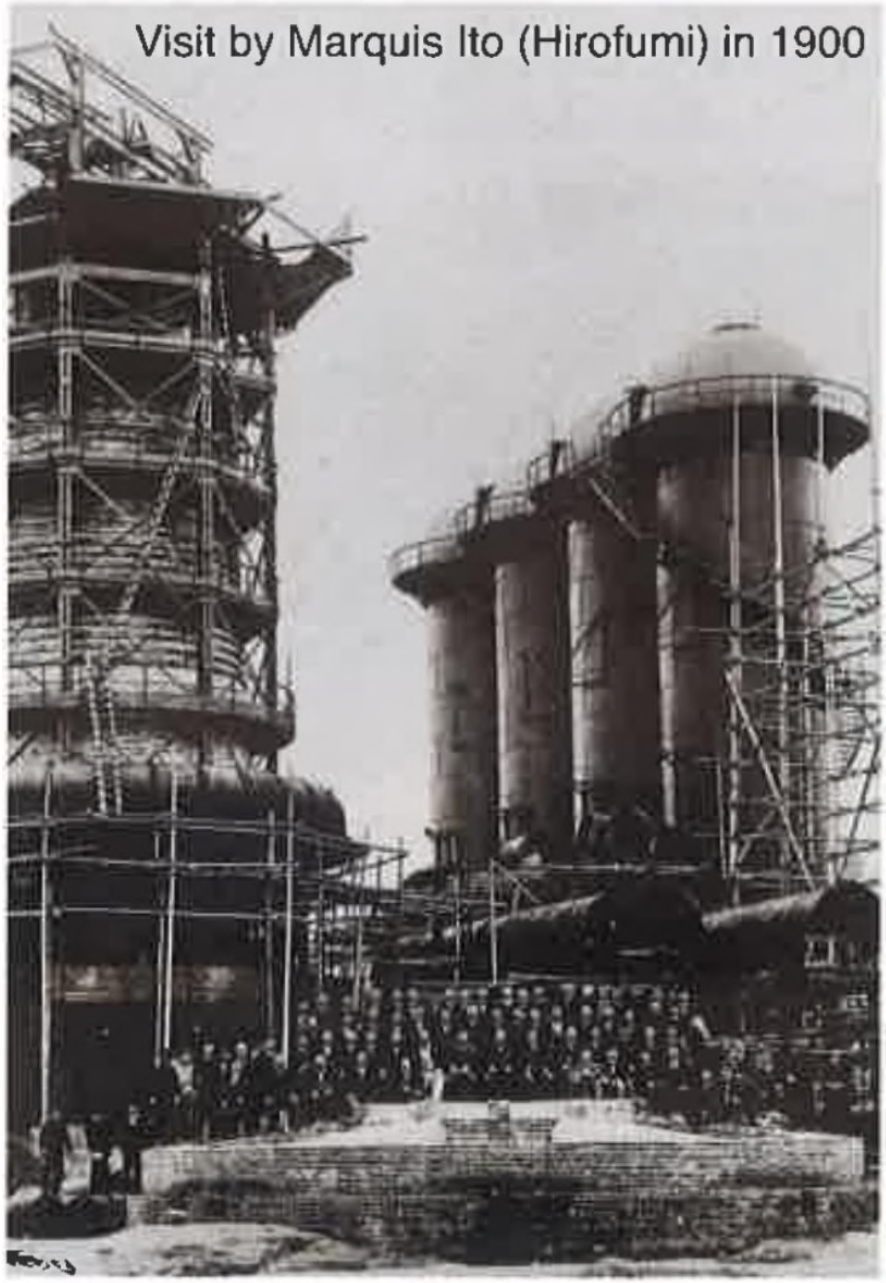
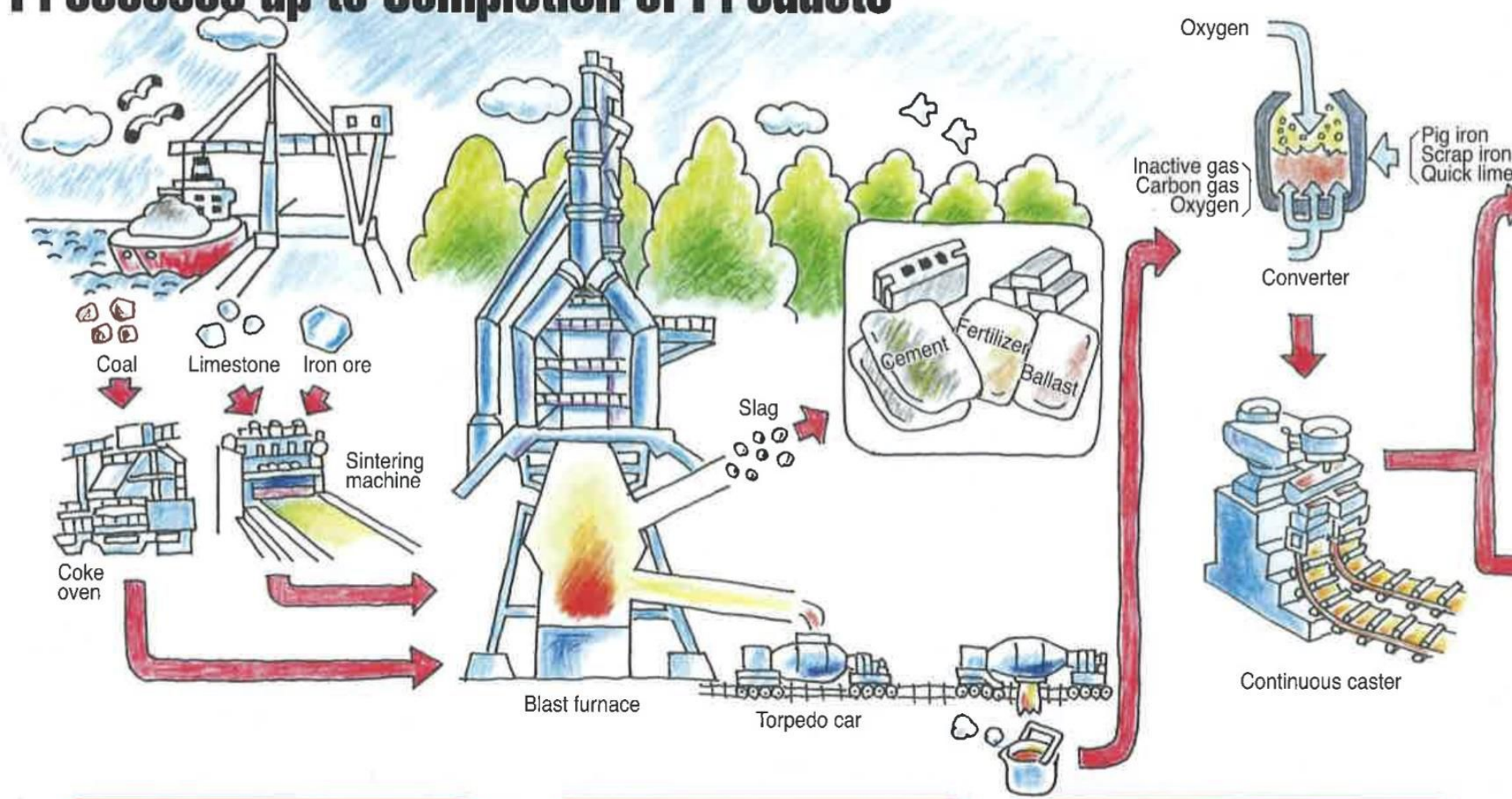


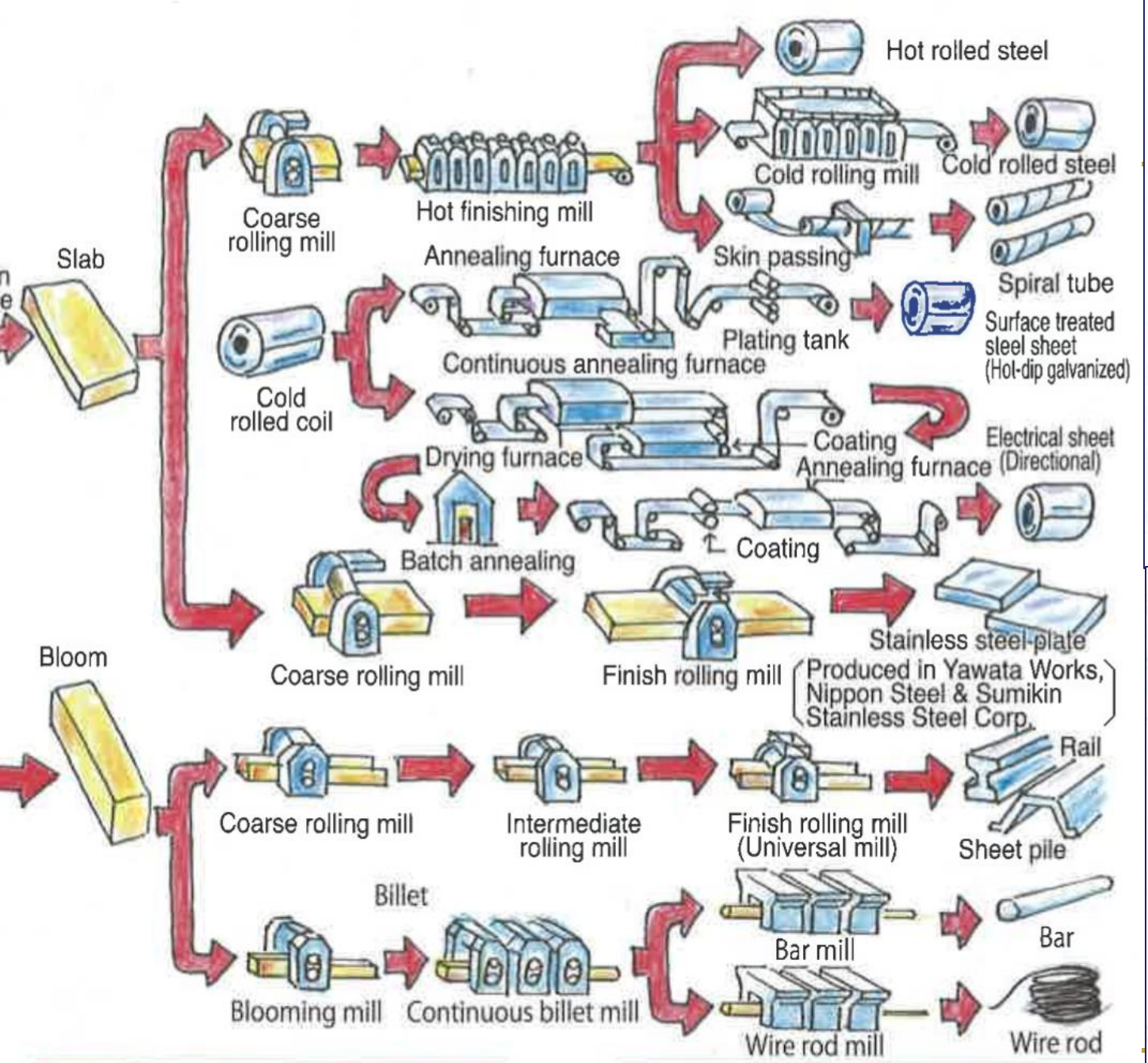
Chronology of Yawata Works

1896	Government announced decision to build iron and steel works in Yawata (March 29)
1897	A Yawata Steel Works office was opened in Yahata Village, Onga-gun, Fukuoka Prefecture. (June 1)
1901	The state-owned Yawata Steel Works began operation. Higashida blast furnace was blown in. (Feb. 5) Operation of a rail & shape mill started. (Nov. 16) The start ceremony of operation was held. (Nov. 18)
1930	Kukioka blast furnace was blown in. (June 17)
1934	Japan Iron & Steel Co., Ltd was founded due to consolidation of iron & steel companies (six companies including Yawata Steel Works). (Feb. 1)
1950	Japan Iron & Steel Co., Ltd was divided into four companies by the Law for the Elimination of Excessive Concentrations of Economic Power; Yawata Iron & Steel Co., Ltd. was formed. (April 1)
1959	Tobata balst furnace was blown in. (Sept. 1)
1970	Nippon Steel Corporation was formed. (March 31)
1988	Shift to the new production system (One-blast furnace operation, receipt of semi-finished products lotted out, etc.)
1998	No. 4 blast furnace began operation in place of No. 1. (No. 1 blast furnace closed.)
2002	Waste Plastics Recycling Facility began operation. (April 1)
2003	Integration of stainless steel business with Sumitomo Metal Industries (launching of Nippon Steel & Sumikin Stainless Steel Corporation (NSSC))

Processes up to Completion of Products



Unloading berth | **Iron-making** | **Steelmaking**



●Rails

●New bullet train

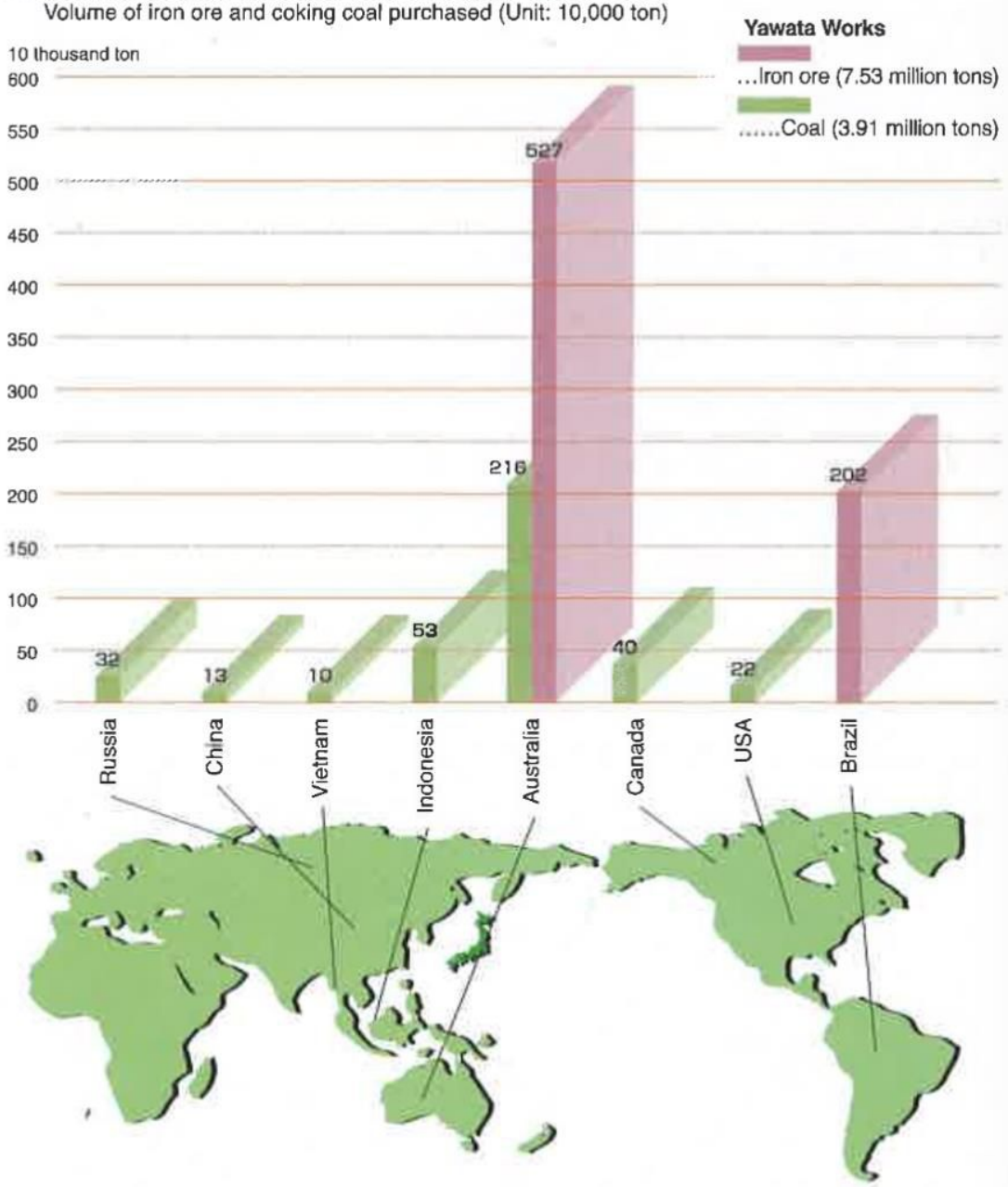
●Steel sheet

●Automobile

Receipt of raw materials

■Conditions of raw materials As of 2015

Volume of iron ore and coking coal purchased (Unit: 10,000 ton)



■What are needed to produce one ton of iron?

Iron ore	1.6 tons
Coke	0.5 ton
Limestone	0.1 ton
Others	0.08 ton
Total	2.2 tons

■Iron usage in various structures/products

Tomei Expressway	550,000 tons
New Tokyo International Airport	400,000 tons
Tokyo Sky Tree	40,000 tons
Kanmon Bridge	30,000 tons
Wakato Bridge	28,000 tons
Tokyo Dome	2,600 tons
Automobile	900 kg
Refrigerator	25 kg

■Number of employees
(as of March 2016)
Yawata Works..... 4,200 people

■Size of Yawata Works
Equivalent to 237 times the Tokyo Dome
Equivalent to 158 times the Fukuoka Yafuoku! Dome

■Water usage quantity (as of 2015)
Daily basis ..... 3.06 million tons
*Return water recovery rate 90%

BUSH LIFE

by

HIROSHI OKANO

THE STORY OF THE DISCOVERY OF THE HARD COKING COAL AT MOURA. CENTRL QUEENSLAND AUSTRALIA.

BUSH LIFE

by

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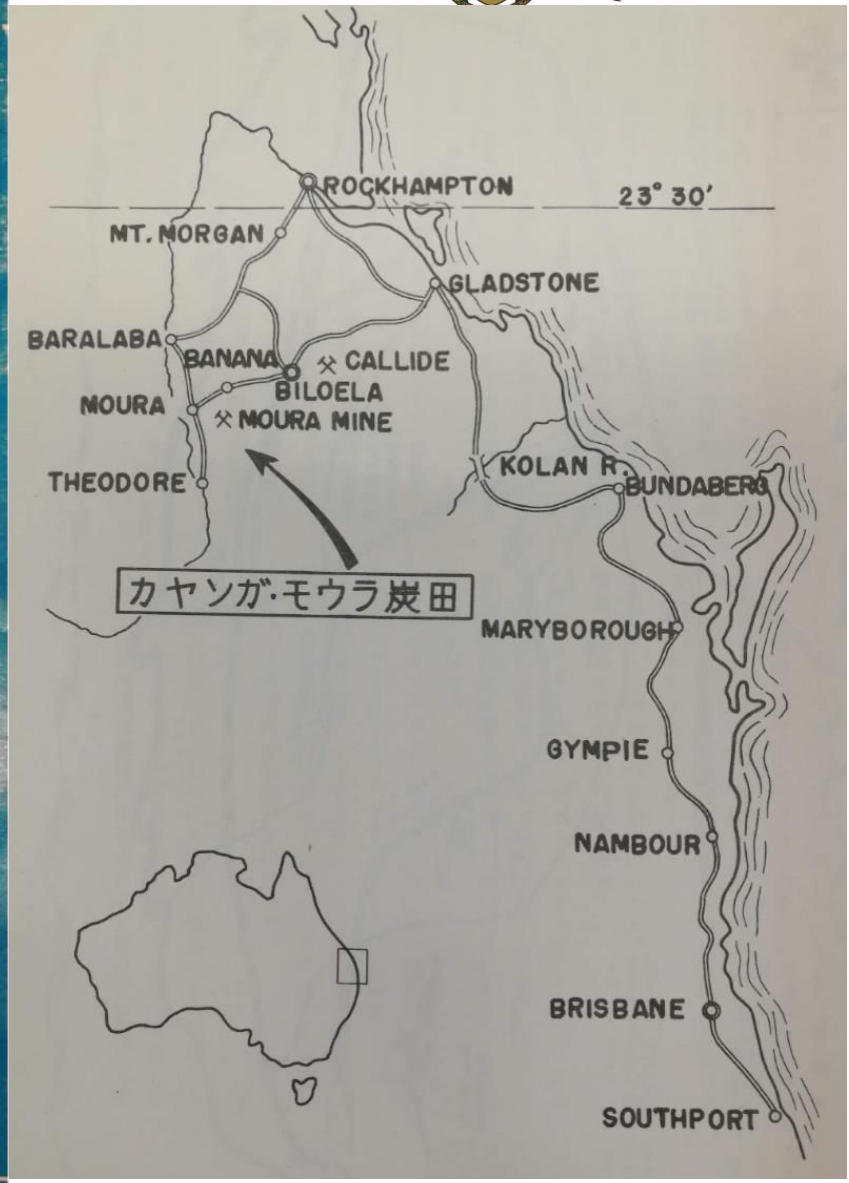
THE STORY OF THE DISCOVERY OF THE HARD COKING COAL AT MOURA. CENTRL QUEENSLAND AUSTRALIA.



Frederick William Whitehouse

F.W. Whitehouse, Morotai, 1945

Born	December 20, 1900 Ipswich, Queensland, Australia
Died	March 22, 1973 (aged 72)
Nationality	Australian
Alma mater	Ipswich Grammar School, University of Queensland, St John's College, University of Cambridge
Awards	Walter Burfitt prize and medal
	Scientific career
Fields	Geologist, Naturalist

Frederick Whitehouse attended Ipswich Grammar School, and went on to study at the University of Queensland. He graduated with a B.Sc., with first-class Honours in geology and mineralogy from the University of Queensland in 1922, and a government gold medal for outstanding merit. He and fellow student **Dorothy Hill**, had collected many fossils during their studies at UQ, which had advanced their individual and shared research in the field.

Whitehouse was Associate Professor of Geology, University of Queensland (1949-1955). **Whitehouse** resigned from the University in 1955. He continued to work as a geological consultant for many oil companies from 1955, and was president of the Anthropological Society of Queensland from 1972 to 1973.

Whitehouse was a close friend of **Dr James O'Neil Mayne** (1861-1939), who with his sister **Mary Emelia Mayne** purchased land in St Lucia in 1926, which was to become the new site of the University of Queensland.

モウラ炭鉱開坑時（１９６１年４月）

(DW)−(DW) ドウソン・ハイウエイ　　(W) ワードルの家

(WA) 現在ここに選炭工場あり　　(MT. W) ワイズマン山

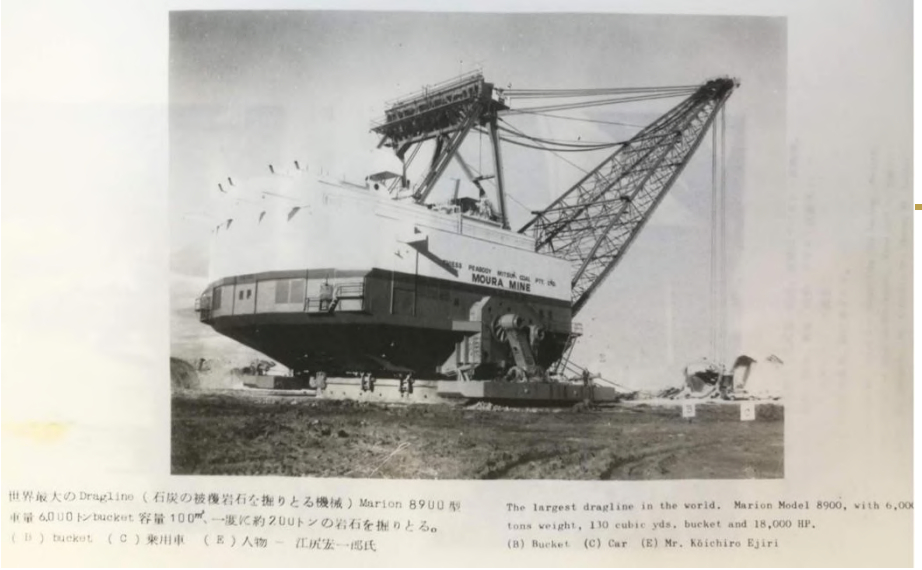
(B) この辺一帯はビショップの所有の牧場で羊が群れていた。

Moura Mine at the begining (Apr., 1961)

(DW) - (DW) Dawson Highway　(W) Mr. Wardle's house

(WA) Washery at present　(MT. W) Mt. Wiseman

(B) Around here was the meadow of Mr. Bishop's property and sheep were grazing here once.



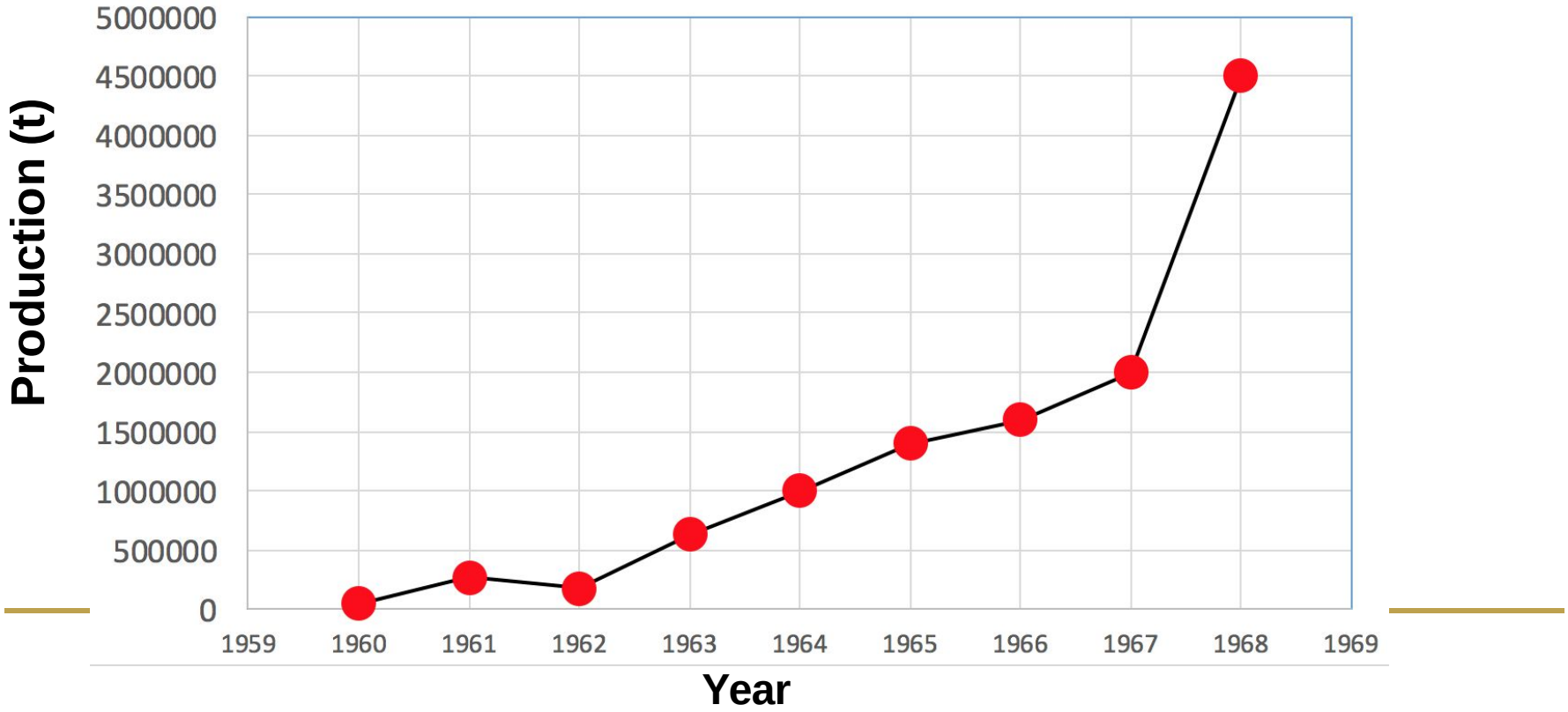
世界最大のDragline（石炭の被覆岩石を掘りとる機械）Marion 8900型
重量6,000トンbucket容量100㎥、一振り約200トンの岩石を掘りとる。
（B）bucket （C）乗用車 （E）人物 － 江尻宏一郎氏

The largest dragline in the world. Marion Model 8900, with 6,000 tons weight, 130 cubic yds. bucket and 18,000 HP.
(B) Bucket (C) Car (E) Mr. Kōichiro Ejiri

モウラ炭鉱全景
（1）選炭工場 （2）ドラッグライン （3）発破のための穿孔機
（N）－（D）Dawson Highway

A bird's eye view of Moura Mine.
(1) Washery (2) Dragline (3) Drilling machine for the blast holes (N) - (D) Dawson Highway (N) - (S) Meridional line

Coal production from Moura mine



Kouzan Chishitsu,
15 (1965) 234-244.

Exploration and Exploitation of Hard Coking Coal in Kianga-Moura Field, Central Queensland, Australia.

by

Hideo KIKUCHI, Masatoshi TSUTSUMI, Hiroshi OKANO, Tadashi SAKAMOTO and Atsuo AIHARA

(Abstract)

Owing to a very limited amount of hard coking coal production in Japan, Japane
been constantly seeking nearer and adequate supply source for that kind of coals
They have been producing hard cokes by blending domestic soft coking coals with
which American coals were dominant until 1955 or so.

In order to fulfill these demands and upon request of the Mitsui & Co., Ltd.,
attention and made studies of the Kianga-Moura Field in Central Queensland, Austr
first field survey from January to April, 1959, we gained the followinge knowledge
conclusion as mentioned below.

(1) In Baralaba, the northern extremity of this field, occurence of anthracite ha
1889 and since then the mines were opened. Many prospecting works were carried
geological features of coal seams in and around the area. The results revealed that
anthracite or anthracite containing 10% or less volatile matter, and that the stru
contorted with NW-SE faults and folds.

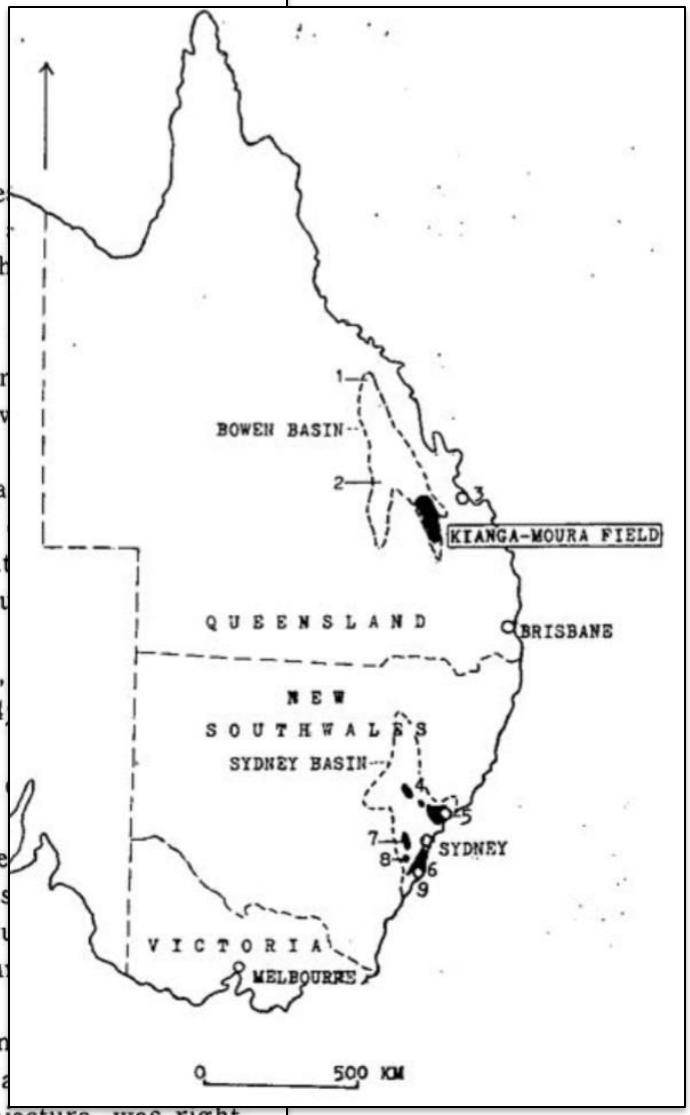
(2) In Kianga, southern sector of the field, the Thiess Bros. (Qld.) Pty., Ltd.,
seam in box-cut after prospecting by drillings. Coal is soft coking coal with 34
matter. The coal seam has a gentle westward dip of 6—8 degrees.

(3) Judging from the geological features of the above two areas, the coal seams
to occur in the same horizon or nearly in the same horizon.

(4) The difference in coal quality between Baralaba and Kianga is thought to be
the tectonic movement by which the complicated structure of the Baralaba area was

(5) The above-mentioned geological assumption leads to a conclusion that mediu
coal with a possibility of hard coking coal, may be concealed underneath the vast u
between Baralaba and Kianga, covering a distance of 60 km.

From the said point of view, the second prospecting work was commenced in Jun
for hard coking coal required by the Japanese Steel Mills, with the cooperation
revealed that our geological conjecture was right,



鉱 山 地 質,15(73),234~244,1965

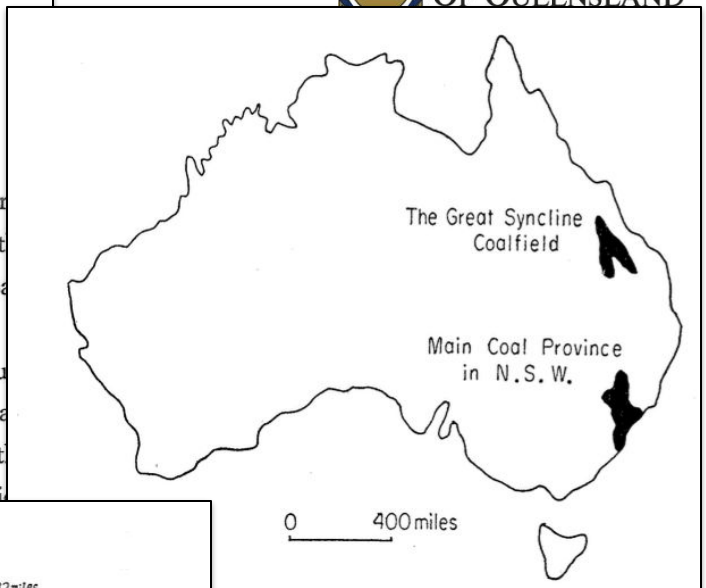
Regional Variation in Rank of Coal in the Great Syncline Coalfield, Queensland, Australia

by Hiroshi Okano and Atsuo Aihara
(Mitsui Mining Company)

SYNOPSIS :—A regional variation of coal quality was recognized within the cour
of writers' 1959～1960 prospecting work for hard coking Coal at Kianga-Moura area in t
Great Syncline Coalfield (Bowen Basin), and some upper Bowen coals in the central pa
of the basin are delt with.

The higher rank (higher C content) coals are protted on the part of lower valu
in a coal band of the H/C versus O/Cdiagram (Fig. 4) reproduced from analitical da
of localities (tab. 1). Distances between coal localities and western limit line of t
"Dawson Tectonic Zone," a striking folding and faulting zone in the south eastern porti
of the basin, connecting Banana and Bluff via Barala
the tectonic zone and regional rank variation is recogr
higher the rank. From a geological view point of mir
the central part of the basin with local exception in
effect to the rank variation is negligible in general. T
of burial) that has important concern to the rank var
limited at the base of Clematis Sandstone according
Taurus, Baralaba and Moura do not correspond with t
depositional facies of coal seams and thickness and na
that the coals near or in the zone were buried in deep
anomalous case, and the thickness of burial might ha
the regional variation of rank.

As a conclusion, most important role had been
of the basin from the begining and migration of centre o
of the Dawson tectonic movement; the increase of
deeper burial of coal seams and added heat and stres
pressure that occoured during the formation of the m
would be effective functions in the course of coalificat



Localty map of the Great Syncline Coalfield

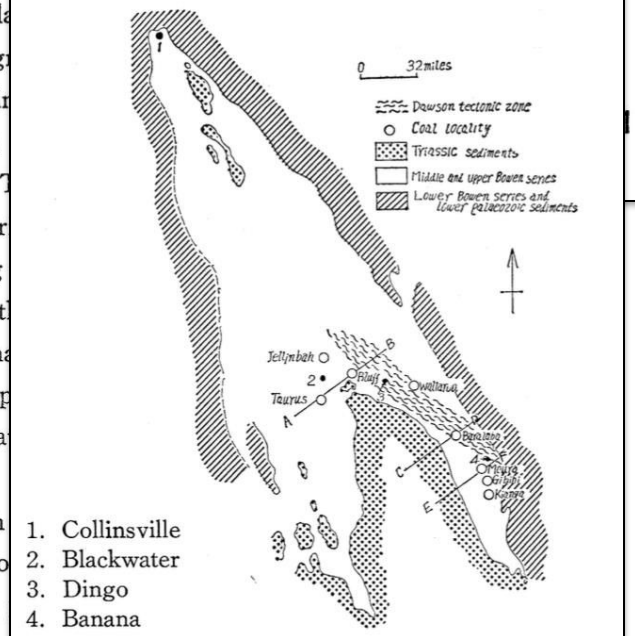


Fig. 3 Locality map of upper Bowen coals in the great syncline Coal Field

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U.D.C.
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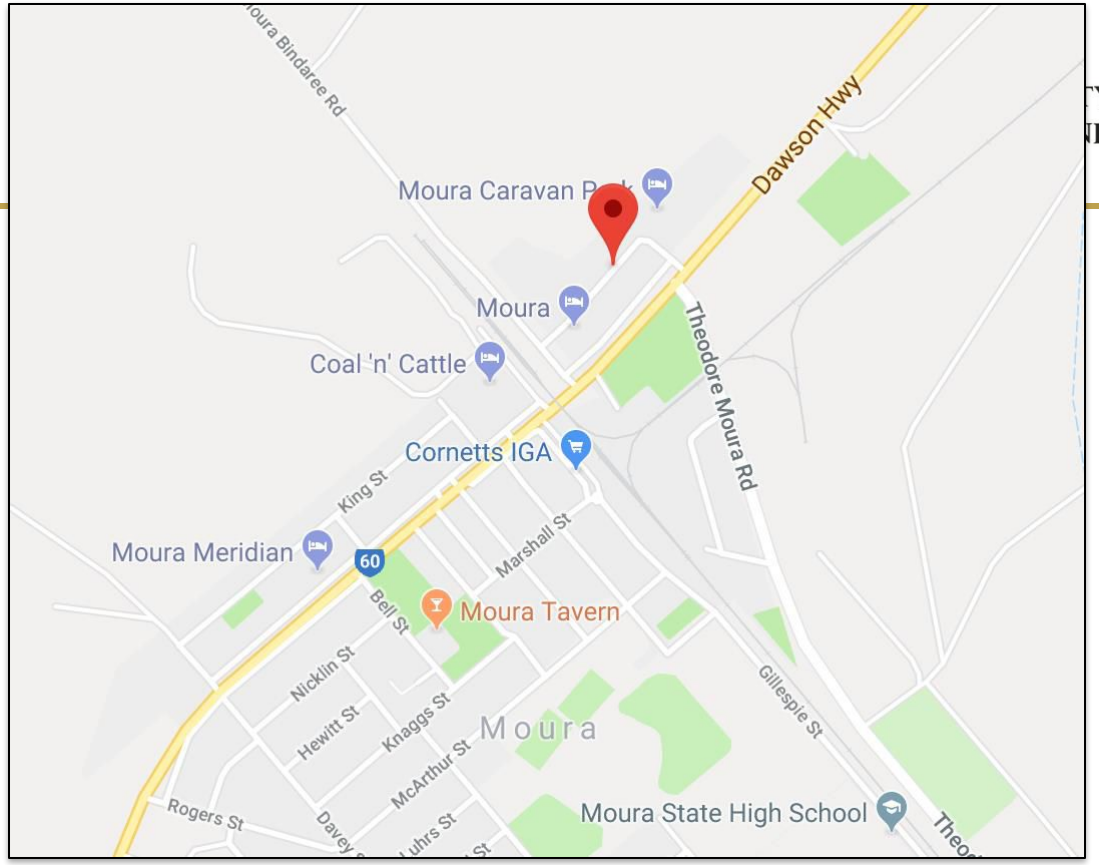
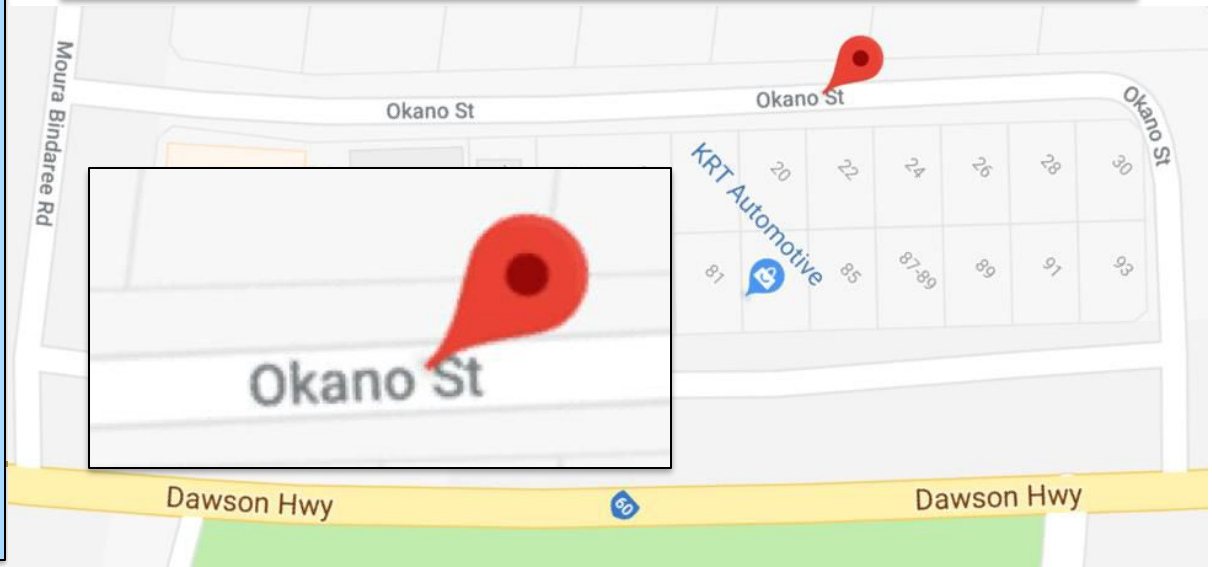
Airlie Beach
Mackay
Rockhampton
Gladstone
Moura
Bundaberg
Hervey Bay
Sunshine Coast
Brisbane
Toowoomba
Gold Coast
Coffs Harbour
Tamworth
Google


Moura Bindaree Rd
Dawson Hwy
Moura Caravan Park
Moura
Coal 'n' Cattle
Theodore Moura Rd
Cornetts IGA
King St
Moura Meridian
60
Marshall St
Bell St
Moura Tavern
Nicklin St
Hewitt St
Knaggs St
Moura
McArthur St
Gillespie St
Rogers St
Moura State High School


Moura Bindaree Rd
Okano St
Okano St
Okano St
KRT Automotive
20
22
24
26
28
30
81
85
87-89
89
91
93
Okano St
Dawson Hwy
60
Dawson Hwy