


FY2014 A MEXT PROJECT STRATEGIC PROMOTION OF FOSTERING CORE PROFESSIONAL HUMAN RESOURCES IN THE GROWING FIELD

RESEARCH AND DEVELOPMENT PROGRAM FOR FOSTERING MRO/AVIATION MAINTENANCE PERSONNEL ADAPTABLE TO THE GLOBALIZATION OF BUSINESS

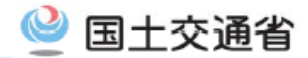
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1) BACKGROUND

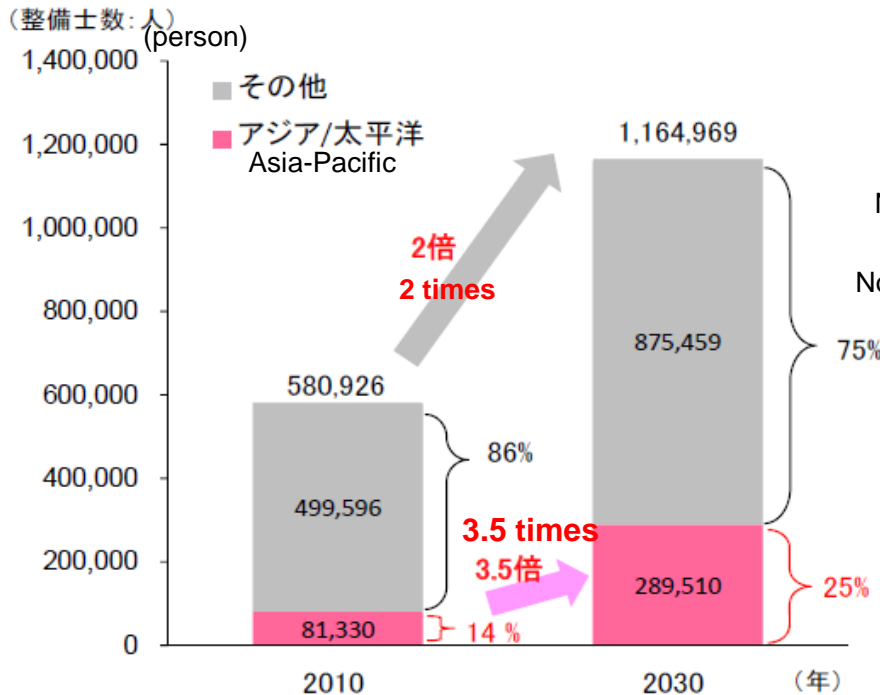
- a. Shortage of Maintenance personnel
 - Remarkable growth of air passengers especially in south-east Asia
 - Distortion of age
 - composition of aircraft mechanics a wine-glass shape of age distribution
 - b. Growth of MRO in Asia
 - In China, Taiwan, Singapore, MROs are growing under auspices of state policy
 - c. Sophisticated capabilities required to field mechanics
 - To cope with the globalization of maintenance site
 - Direct talk to field mechanics by foreign inspectors/customers
 - Need higher communication capability, knowledge on foreign regulations, custom etc.
-  Need to urgently foster a number of advanced /core MRO/Maintenance human resources

Number of Mechanics 国際的な整備士の需要見通し(Expected, Worldwide)



- 世界的な航空需要の増大に伴い、国際的に2030年には現在の2倍の整備士が必要とされると予測されている。
- アジア／太平洋地域では、2030年に現在の約3.5倍の整備士が必要とされると予測されている。

Number of Mechanics



	Worldwide 世界	Asia-Pacific アジア/ 太平洋
No. of Mechanics As of 2010 2010年時点の整備士数	580,926	81,330 person
No. of Mechanics required at 2030 2030年時点の整備士数	1,164,969	289,510
整備士の必要養成数(年間)	70,331	19,010
整備士の供給可能数(年間)	52,260	4,265
整備士需給バランス(年間)	△18,071	△14,745

※航空運送事業の用に供する航空機の数約6.2万機(2010年)から約15.2万機(2030年)に増加するとの予測に基づき推計

Source

出典: ICAO 「Global and Regional 20-year Forecasts : Pilots・Maintenance Personnel・Air Traffic Controllers」

TWO TYPES OF HUMAN RESOURCES TO BE FOSTERED



2) OBJECTIVES & DELIVERABLES

◆ Objectives

- To develop, in cooperation with graduate schools, Kosen technical colleges and air technical colleges, education program that will foster advanced and core human resources.
- They are capable of competing with the challenges from foreign companies, managers, mechanics or capable of working in foreign MROs having competencies such as excellent communication ability, ambitious to advance in study/research, willingness for team work etc.

◆ Deliverables

- **1st year(FY2014)**; research on the requirements from companies, skill standard frames, curricula of aircraft engineering, maintenance related field etc., development of skill standard for MRO management and mechanics
- **2nd year(FY2015)**; completion of skill standard, development of curriculum and text & course materials (partial)
- **3rd year(FY2016)**; completion and Evaluation of curriculum/text/course materials developed

3) PARTICIPANTS

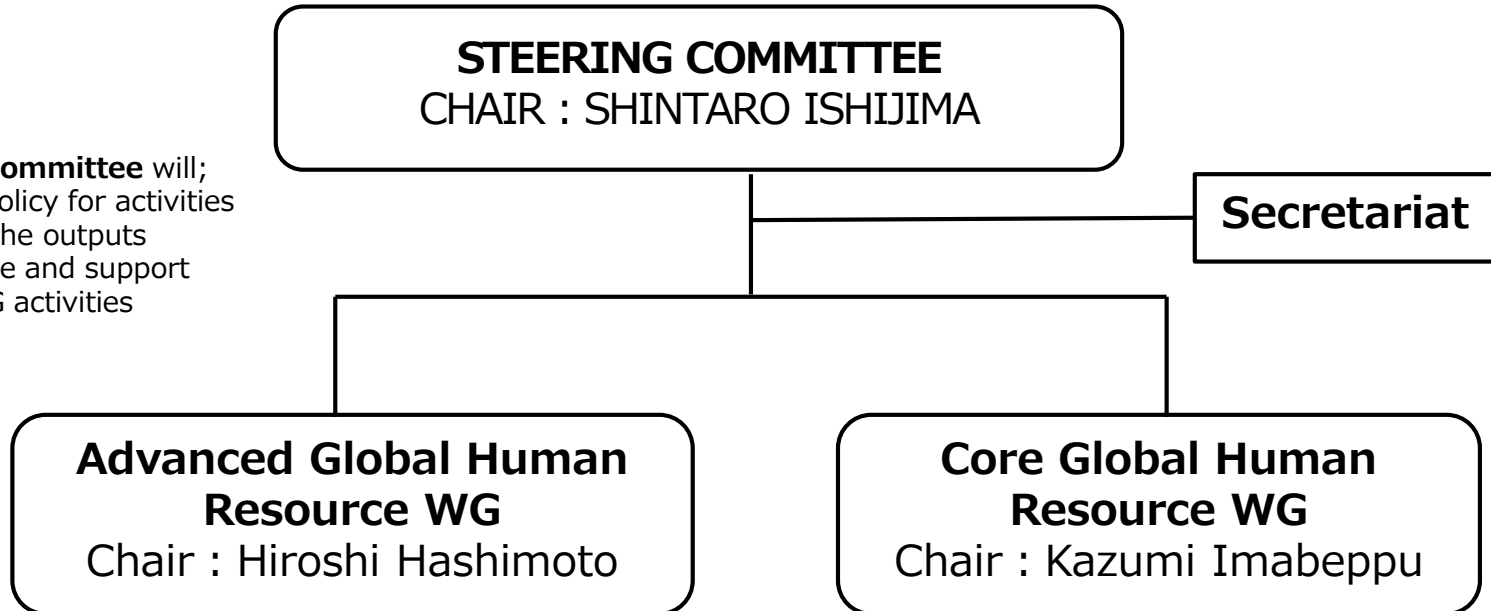
No.	Participants
1	AIIT
2	TMCIT
3	East Japan Air Technical School
4	Tohoku Computer College
5	Osaka College of Technology
6	Funabashi Information Business College of Technology
7	All Nippon Airways Co. Ltd.
8	Fujitsu Ltd.
9	NIPPI Corp.

No.	Participants
10	JAMCO Corp.
11	Mitsubishi Heavy Industries, Ltd.
12	SPP Nagasaki Engineering Co. Ltd.*
13	IHI Corporation*
14	Japan Aeronautical Engineers' Association
15	Next-Generation Regional Air Network Council
16	Eva Aviation. Com Co., Ltd.*
17	Flight Tech Service Co., Ltd.
18	Japan Techno-Economics Society *

*: Joined from FY 2015

4) PROMOTIONAL ORGANIZATION

- Steering Committee** will;
- Set up policy for activities
 - Specify the outputs
 - Supervise and support each WG activities



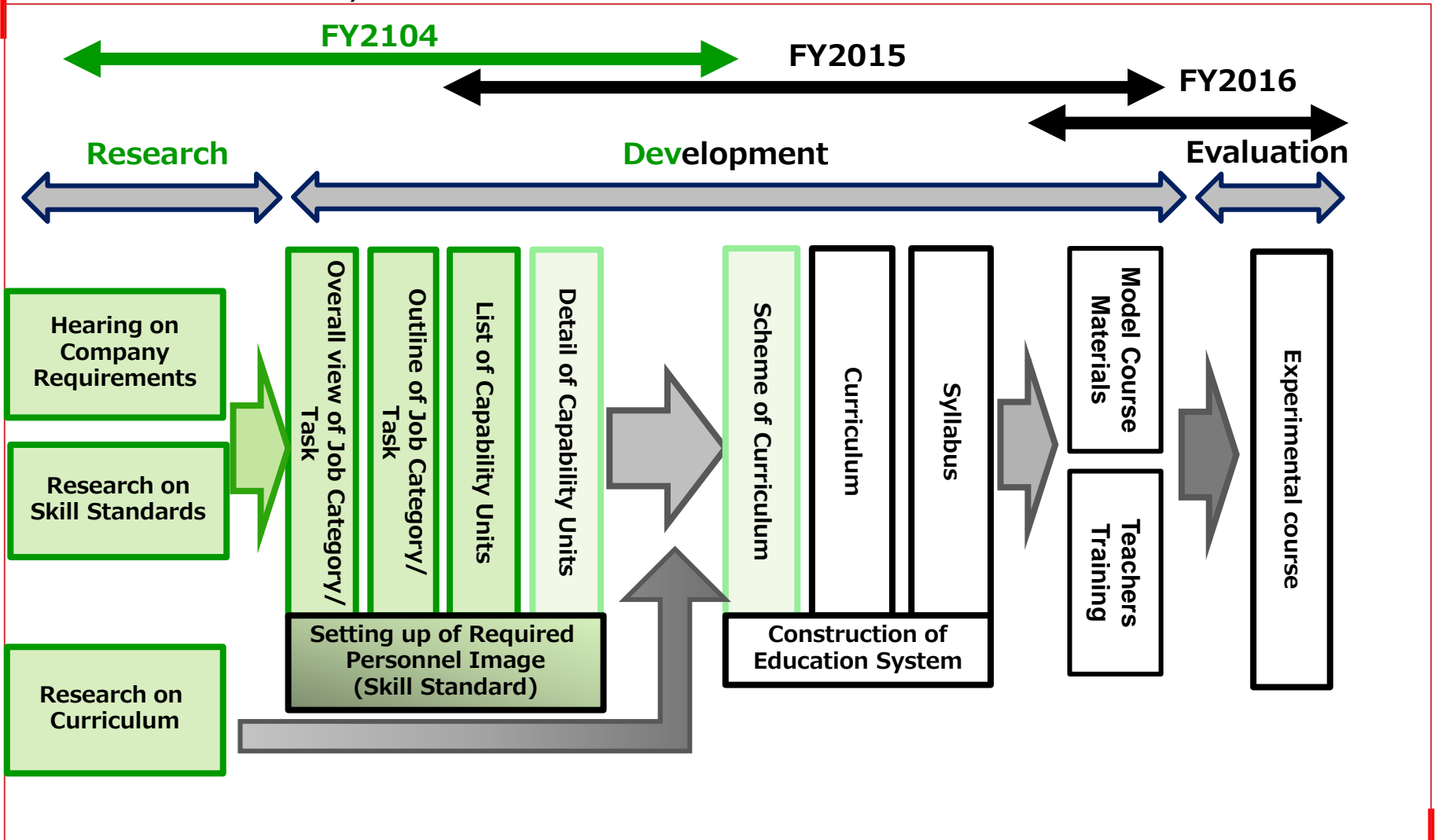
- AGHR-WG** will;
- research** the knowledge, capabilities and competency,
 - develop** curriculum, course materials, education methodologies, etc.,
 - study** how to evaluate or demonstrate the development results,

Those are necessary to foster advanced human resources who have affluent entrepreneur spirit and management sense, and are needed for global business expansion of aerospace related companies such as aircraft operators, maintenance companies and original equipment manufacturers

- CGHR-WG** will;
- research** the knowledge, capabilities and competency,
 - develop** curriculum, course materials, education methodologies, etc.,
 - study** how to evaluate or demonstrate the development results,

Those are necessary to foster core human resources who are adaptable to the globalization of business activities of aerospace related companies such as aircraft operators, maintenance companies and original equipment manufacturers, and who are expected to lead and nurture junior technicians as the core person of the site.

5) PROCESS OF PROJECT ACTIVITIES



Committee Meetings;

(1) Committee Meeting #1 Sept. 9, 2014 (14:00~17:00)

- Overall Project Scheme
- Project Activities in FY2104 (Research, Dev. Skill Standard, Curriculum Scheme)
- Outline of maintenance work at operators
- Challenges in the human resource development at aircraft maintenance company
- Present status of foreign MROs
- Challenges in the education of aviation colleges

(2) Committee Meeting #2 Dec. 12, 2014 (14:00~16:00)

- Report on the hearing results
 - Basic scheme of Skill standard (overall Structure of job Category/Task)
 - Report on ACT forum

(3) Committee Meeting #3 Feb. 20, 2015 (13:00~15:00)

- Research results
- Skill Standard
- Scheme of curriculum
- Activities of next year

1) RESEARCH ACTIVITIES

(1) Hearing to operators/Maintenance Companies

Conducted several hearing to member companies, NPOs, Universities etc. to clarify the requirements needed for advanced and core human resources

(2) Research on Curriculum

Conducted researches on aeronautical and aircraft maintenance related curricula of the educational institutes in and out of Japan

(3) Research on Skill Standard

Conducted researches on the scheme of Skill Standards already established and earned certain reputation

2) DEVELOPMENT ACTIVITIES

(1) Skill Standard Design;

Defined the image of advanced and core human resources who play active roles in global aircraft maintenance business

(2) Curriculum development;

Developed a frame of curriculum for nurturing the advanced and core human resources who play active roles in global aircraft maintenance business

1.1) Outline of Research

(1) Hearing

- Conducted hearings to gather information necessary for skill standard development (6 companies, 3 aerospace organizations and 3 educational institutes)

(2) Curriculum

- Collected curriculum relating to aircraft maintenance and MOT of aviation colleges, universities (overseas/ domestic) as the base information for study of aircraft maintenance personnel development

(3) Skill Standard

- Collected skill standards for several industries (IT skill standard, design skill standard etc.) as the base information for development of skill standard for MRO personnel

1.2) Hearing Results

(1) Requirements for MRO personnel

- Able to read M/M (English), understand the contents and conduct the task
- Knowledge on human factor that closely related to the safety of passengers and crew
- tact or consideration to the others as well as to own Task

(2) The duties or roles

- Jobs at site; Structure, mechanical and electrical equipment, and sheet metal etc. - Each job is divided into further details such as dis-assembly/assembly, painting, inspection etc.
- Along with advancement of aircraft technologies, engineers in the field of electric/electronics and composite materials will be in short.

(3) Career passes

- Even Bachelors, they start from field work at maintenance site. After several year of field work, they choose a pass for managers or specialists in maintenance.

(4) Company qualification and in-house training

- Each company sets its own qualification system apart from state qualification
- Job assignment follows the in-house qualification
- Necessary years to get in-house qualification vary from the person

1.3) The job of MRO in the US

MRO Job Example of in the US

(1) Aircraft Maintenance Manager (excerpt)

- Manage and monitor all aircraft, support equipment, and component maintenance.
- Plan, coordinate and schedule the aircraft maintenance procedures.
- Develop process improvements for aircraft installation and maintenance activities.

(2) Aircraft Mechanic (excerpt)

- Inspect aircrafts for any component defects, break-outs, fluid leakages, etc.
- Assemble and disassemble various components of aircraft during repairs and maintenance.
- Perform oil changes, battery service, hydraulic system service and other aircraft servicing tasks.

Note; job types and duties of MRO in the US are found almost comparable with that of maintenance section of Japan's operators and maintenance service companies.

2.1) Curriculum of an Aviation College in Japan

	科目 Subject	1 年次 1st Year	2 年次 2nd Year		3 年次 3rd year		合計 Total (時間数)(hr)		単位数 Credits		
			A	B	A	B	A	B	A	B	
一般 科目 General Subject	一般教養 Liberal Culture	69	51	140	50	160	170	369	11	24	
	英語 English	50	20	70	30	70	100	190	6	12	
	コンピュータ実務 Computer Practice	40		45		80	40	165	2	11	
	CAD			15		50		65		4	
	航空工学 Aircraft Engineering	31	62	130	105	380	198	534	13	36	
	溶接 Welding			30				30		1	
専門 科目 Special Subject	学 科 教 育 Lecture	航空法規 Aviation Laws	30	15	15	15	60	70	4	3	
		基本技術 Technology - Basic	140	50	50	80	270	170	18	12	
		航空力学 Aerodynamics	50	30	34		80	100	5	5	
		機体 Airframe	102	65	80		167	198	11	12	
		Recipro. Engine ピストン発動機	87	53	53		140	130	9	9	
		装備品 Equipment	139	78	97		217	256	15	15	
	実 技 教 育 Practical Training	試験 Testing	36	11	11	3	50	47	3	3	
		基本技術実習 Basic Skill Training	60	90	60	100	60	250	140	8	6
		機体実習 Airframe Maintenance	40	180	70	386	150	606	260	20	8
		Recip. Engine Maintenance ピストン発動機実習		150	70	101		251	70	8	2
		Equipment Maintenance 装備品実習	126	145	30	80		351	156	11	5
		合計 Total Hr.	1000	1000	1000	950	950	2950	2950	144	168

2.2) Curriculum (Aircraft Maintenance Course, Department of Space and Air System, Faculty of Engineering) (No official Translation)

	1 st year	2 nd year	3 rd year	4 th Year
Specialty Basic	Information Processing - Basic	English - Specialized I / English - Specialized II		
Specialty	Aerospace Material Mechanics of Materials I Structural Dynamics Aero-Fluid Dynamics I, II Aircraft Dynamics I, II Aircraft Repair - Basic Aircraft Part/Equipment -Basic Laws on Aircraft Maintenance Electric Engineering - General Mechanical Engineering - General Measurement Engineering - General etc.	Guidance and Control II Aircraft/Spaceship Guidance and Control Aircraft - General Aerospace Engineering Special Lecture I Force and Vibration	Aerospace Engineering Special Lecture II	Mechanics of Materials II Fluid Dynamics - Basic Thermodynamics - Advanced Aircraft Propulsion Engineering Special Category Aircraft - General Graduation Work
Experiments / Practical Training/ Drill	Aerospace Engineering Drill I Aircraft Performance/motion Drill I Drafting - Basic Drafting and Design I, II Aircraft/Spaceship Drafting and Design	Aircraft Systems - Basic Aircraft Systems Practical Training I Aircraft Inspection - General Aircraft Electronic and Electric Equipment Practical Training Etc.	Aerospace Engineering Drill III Aircraft Systems Practical Training II Aircraft Performance Testing Practical Training Aircraft Equipment - Basic Aircraft Power Plant Aircraft Maintenance Practical Training Aerospace Engineering Experiment II	
General Subject			General Subject II Special Activities I, II	English I-IV Etc.

2.3) Outline of Curriculum (Avionics Maintenance Technology course of a Aviation College in the USA)

Core Electronic Technology Courses
Introduction to Electronics Aviation Fundamentals Basic Mechanics AC Theory & Semiconductor Devices Electronic Circuits Digital Circuits and Devices Principles of Electronic Communication
Specialty Courses
Aircraft Systems Aircraft Communication and Navigation Systems Aircraft Radar Systems and Avionics Line Maintenance
General Education Courses
English Composition I Career Communications American History: 1865 to Present American Federal Government Fundamentals of Public Speaking

2.4) Outline of Curriculum (Aviation Management Degree of an University in the USA)

1st SEMESTER	2nd SEMESTER
Introduction to Aviation Technology Basic Aircraft Science / Private Pilot Lectures Precalculus / English Composition Selective	Aviation Business / Aerospace Vehicle Propulsion Technology and the Individual / General Physics Calculus Selective
3rd SEMESTER	4th SEMESTER
Aviation Operations Management Aviation Projects / Introductory Accounting Fundamentals of Speech Communication Humanities Foundational Selective	Aerospace Vehicle Systems / Aviation Operations Management Accounting I / Economics Selective Science Foundational Selective
5th SEMESTER	6th SEMESTER
Aviation Management Selective Aviation Management Selective Elementary Statistical Methods Thematic Area Selective Behavioral / Social Science Selective	Managerial Economics in Aviation Aviation Law Thematic Area Selective Advanced English Selective Free Elective
7th SEMESTER	8th SEMESTER
Aviation Finance / Senior Standing Aviation Safety Problems Aviation Management Selective Thematic Area Selective / Free Elective	AT Capstone / Thematic Area Selective Aviation Management Selective Technical Communication Selective Free Elective / Globalization

3) What is Skill Standard?

- A common yardstick that systematize the skill and knowledge items, and their level applicable to each business type and job type needed by respective industry segments
- With skill standard, each industry segment is effectively able to get common understanding on the necessary education and training, objectivity in evaluation of human resources
- Merits for;

Corporates

It becomes easier and more effective to foster human resources by deliberated human resource development plan.

Individuals

It becomes easier for employees, career movers and job-seekers to set a plan for their career progression and to get the goal.

Educational Institutes

It becomes easier for educational institutes to develop a curriculum that directly linked to the need of industries.

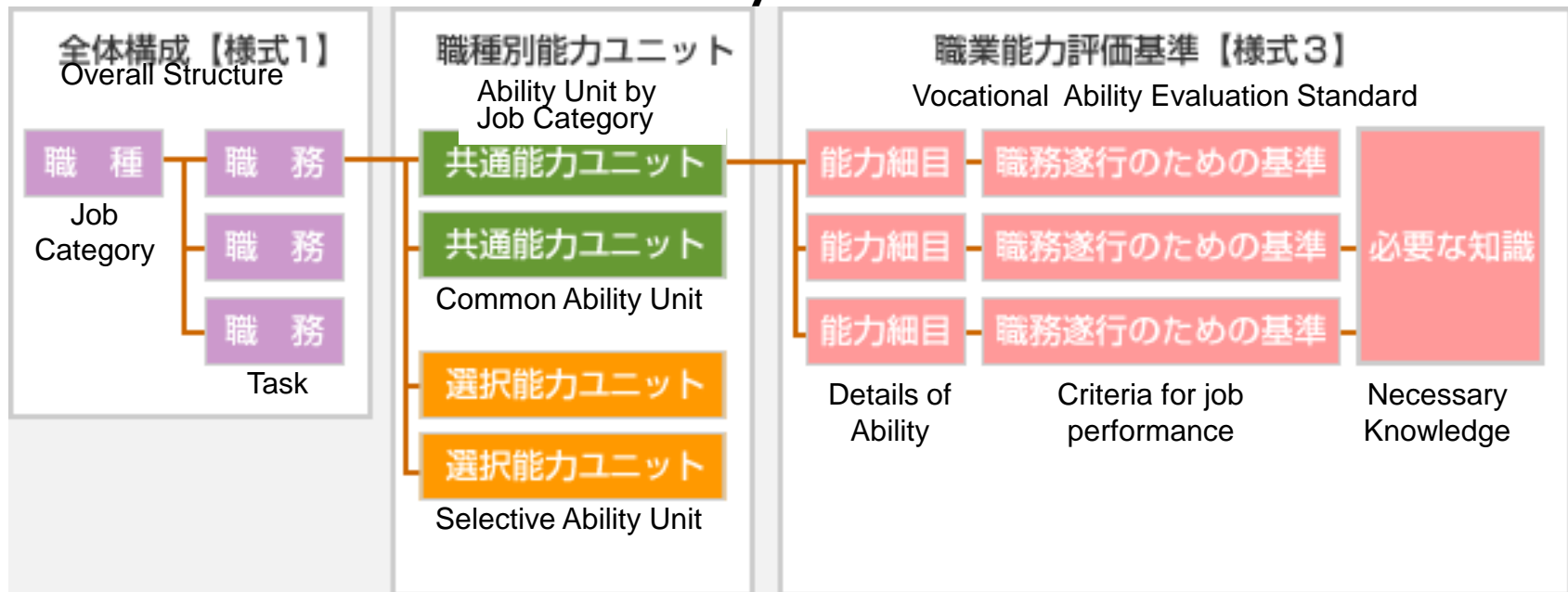
3.1) Skill Standards studied;

- (1) Vocational Ability Evaluation Standard
- (2) Skill Standard Tokyo Version
- (3) IT Skill Standard etc.

3.1.1) Vocational Ability Evaluation Standard

- A skill standard developed by Japan Vocational Ability Development Association (JAVADA)
- This skill standard objectively indicates practical vocational ability of workers actually required by companies irrespective of their job career or qualification
- Developed based on job analysis through research on companies site. Skill standards for 48 industry sectors, 245 job types are developed.

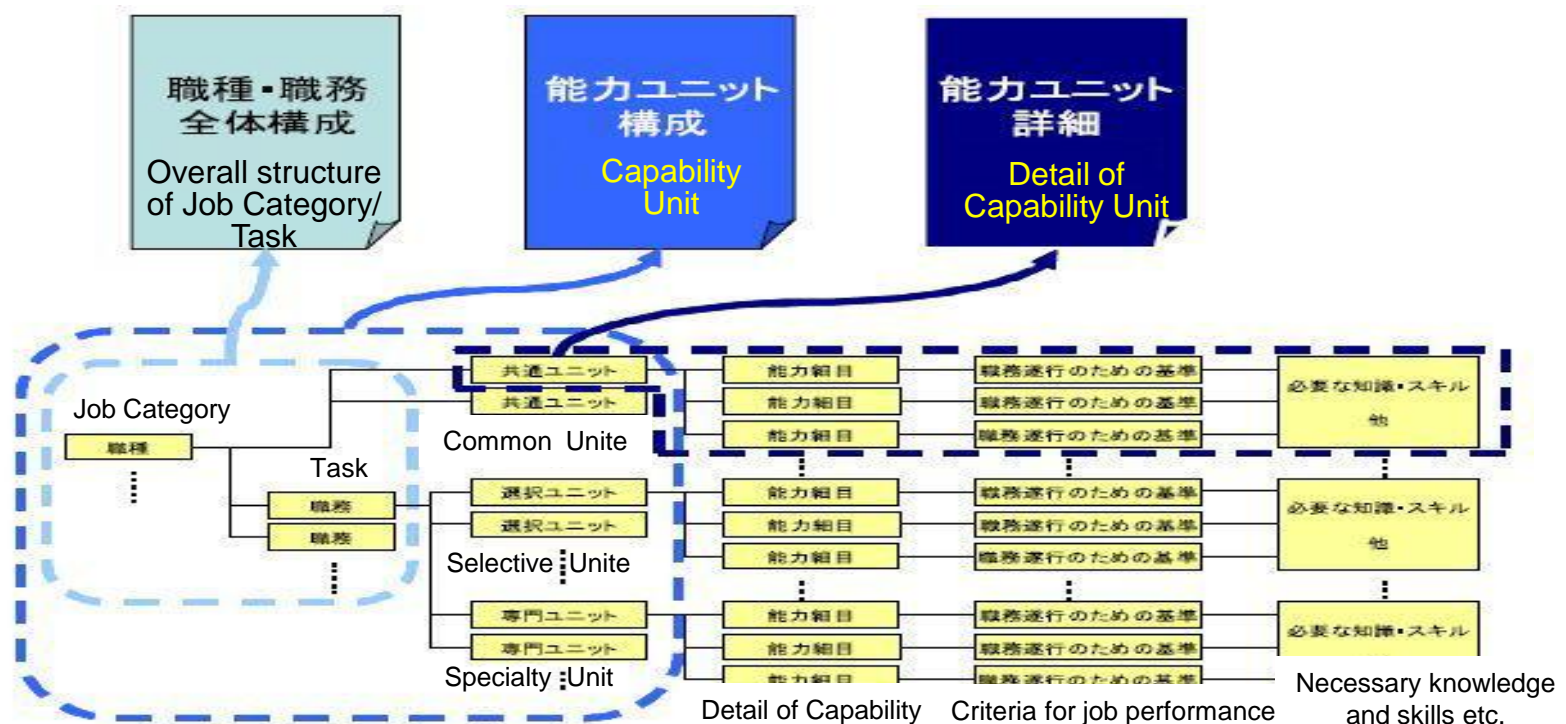
● Structure of Vocational Ability Evaluation Standard



3.1.2) Skill Standard Tokyo Version

- A skill standard developed by an Executive Committee for the standard set by Tokyo Metropolitan Government (Chair; Dr. Shintaro Ishijima)
- Can be commonly usable in a industry sector due to unified structure and statement style
- Easy to coordinate with a range of curricula provided by education institutes
- Skill Standard Tokyo Version for Industrial Design was developed

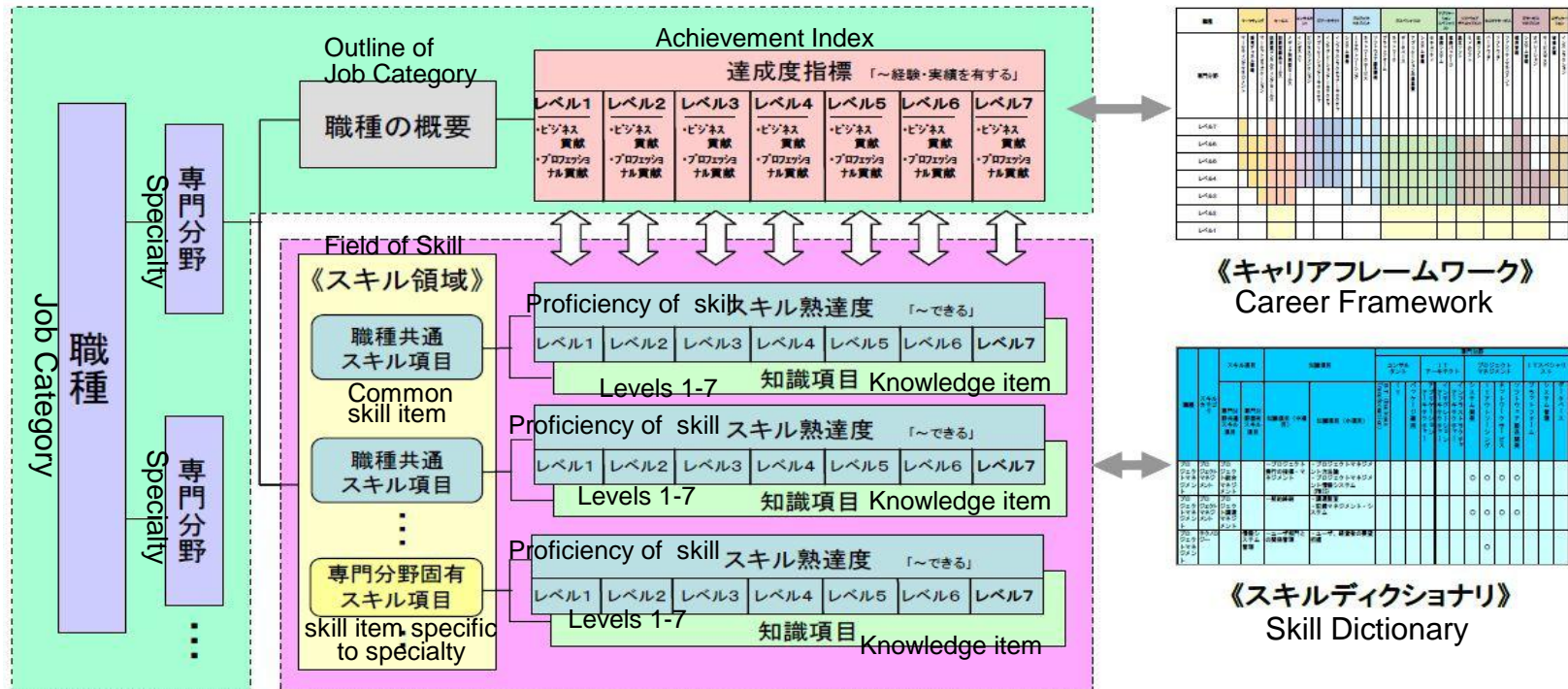
● Structure of Skill Standard Tokyo Version



3.1.3) IT Skill Standard

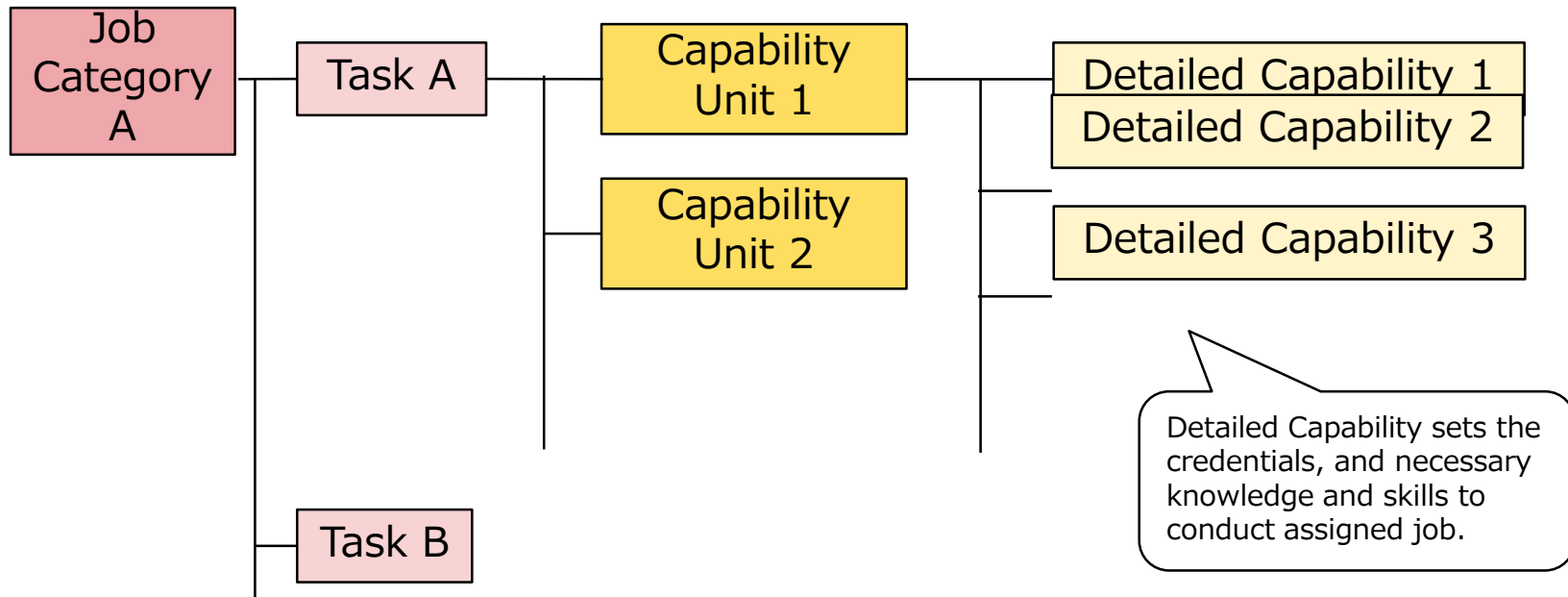
- Developed by INFORMATION-TECHNOLOGY PROMOTION AGENCY (IPA: A specially approved governmental agency)
- A common framework useful for education & training of IT service professionals by clarifying and systematizing necessary capabilities to render IT related services
- Categorize IT related services into 11 job types and 35 specialty fields, and specifies required capabilities and their

● Structure of IT Skill Standard



3.2) General Structure of Skill Standards

- Job Category : A group of duties that have commonalities in job nature of each industry sector
- Task : A unit of job that each employee shall perform and is included in a job Category
- Capability Unit : Necessary capability to conduct an assigned Task
- Detailed Capability : Details of capability required by Capability Unit



3.3) Development of Aircraft Maintenance Business Skill Standard

- **Objective;**

- To specify clear images of advanced and core human resources for aircraft maintenance business such as qualifications, knowledge and skills, competencies required
- Education program for professionals shall be based on such clear images

- **Methodology;**

- Design basic scheme of skill standard such as structure, items to be described etc. based on the information obtained through the research on other skill standards
- Obtain pieces of information such as details of business/job, required knowledge and skills, in-house qualifications, training system etc. based on the information obtained through hearings/researches to operators, maintenance companies, NGOs etc., sort out, and fill the each sheet of skill standard as a draft.
- Evaluate the draft in committee/working group meetings or independent hearings and rectify the draft.
- Approve the rectified skill standard in the committee

(1) Overall structure of Job Category and Task;

- A table that shows overall structure of Job Category and Task, and job level of aircraft maintenance related business

(2) Outline of Job Category and Task;

- Stipulates the position in the aircraft maintenance related business of the corresponding Job Category and Task, job description, required knowledge/capability/ experiences/qualifications etc.

(3) Table of Capability Unit;

- A table that shows "Common Capabilities" those are commonly required for all the jobs included in each Job Category, and "Specialized Capabilities" those are specifically required for each job

(4) Detail of Capability Unit

- A document that sort out items of detailed capabilities, job performance criteria for admitting a personnel having enough capabilities, and necessary knowledge and capabilities for the Capability Unit. There are two kinds of Detail of Capability Unit, for Common Capability and Specialized Capability.

種類	高度グローバル職 (マネジメント職)						中核のグローバル専門職 (監修現場職)								
	経営		技術		機体		整備品		整備品		品質				
職種	経営	企画	財務	営業	設備	安全	整備	生産	技術	訓練	機体	部品	整備	検査	品質
職務	経営	企画	財務	営業	設備	安全	整備	生産	技術	訓練	機体	部品	整備	検査	品質
レベル4 全体を統括・管理する															
レベル3 下位者を管理し、指示を行う															
レベル2 目立して業務を行う															
レベル1 指示・指導を受けて業務を行う															

1. Overall structure of Job Category and Task

2. Outline of Job Category and Task

3. Table of Capability Unit

4. Detail of Capability Unit

3.3.1A) OVERALL STRUCTURE OF AIRCRAFT MAINTENANCE RELATED JOB

Type	Tasks for Advanced Global Human Resources (Management Work)									Tasks for Core Global Human Resources (Maintenance Work)								
Job Category	Management					Engineering				Airframe			Equipment			QC		
Task	General Affairs	Planning	Financial Affairs	Marketing	Logistics	Safety Management	Production	Technology	Training	Quality Assurance	Airframe	Electric/ Electronics	Structure	Aircraft Interiors	Aircraft Equipment	Power Plant	Avionics	Inspection
Level 4 control overall business																		
Level 3 Manage & instruct junior staff																		
Level 2 Conduct own job independently																		
Level 1 Conduct own job with supervision																		

3.3.2A) OVERALL VIEW OF JOB FOR GLOBAL CORE HUMAN RESOURCES (MAINTENANCE JOB)

Type	Category	Task	Outline of Job
Tasks for Core Global Human Resources (Maintenance Site Work)	Airframe	Airframe	Inspection, trouble shooting, disassembly, assembly, exchange/replenishment of lubricant, cleaning, replacement of equipment/parts of aircraft, etc
		Electric/ Electronics	Inspection, trouble shooting, removal, repair/exchange, cleaning, replacement, installation, adjustment of equipment/parts/software of electric and electronics system of aircraft etc
		Structure	Inspection, trouble shooting, repair of structural parts such as metal, composite and plastic components, inspection and exchange of fasteners, paint removal and painting of aircraft, etc
	Equip- ment	Aircraft Interiors	Visual inspection, trouble shooting, disassembly, cleaning, inspection, repair, assembly, final testing of aircraft equipment such as seats, lavatories, galleys, panels, emergency equipment, etc. of aircraft
		Aircraft Equipment	Functional testing, trouble shooting, disassembly, cleaning, inspection, adjustment ,repair, assembly, final testing, removed from an aircraft of aircraft equipment such as hydro/pneumatic equipment, landing gears, rotor blades, transmissions etc.
		Power Plant	Visual inspection, trouble shooting, disassembly, cleaning, inspection, adjustment ,repair, assembly, trial run of engines and propellers of an aircraft
		Avionics	Functional testing, trouble shooting, disassembly, inspection, repair/ exchange, assembly, software installation, final testing, removed from an aircraft of aircraft equipment such as instruments, electro/electronic/Nav-Com equipment, etc.
	Quality Control	Inspection	Ground inspection, flight inspection

3.3.3A) REQUIRED LEVELS FOR GLOBAL CORE HUMAN RESOURCES (MAINTENANCE JOB)

Type	Tasks for Core Global Human Resources (Maintenance Work)
Categories	Airframe/Equipment/Quality Control
Level 4 control overall business	(Level 4 is not assumed for these job categories)
Level 3 Manage & instruct junior staff	Required level of capability; <ul style="list-style-type: none"> • To manage the team members and business at given place of work • To instruct and foster junior staffs based on higher special knowledge • To preside and order job instructions to team members
Level 2 Conduct own job independently	Required level of capability; <ul style="list-style-type: none"> • To advance or expand the ability in the field of specialty relating to the job • To support leader of the organization and give job instructions to working team with assignment by the leader • To understand conditions and contents of the job and conduct them properly • To conduct jobs based on proper judgment including response to accidents and prevention of recurrence of the accidents
Level 1 Conduct own job with supervision by seniors	Required level of capability; <ul style="list-style-type: none"> • To conduct routine or basic jobs • To conduct jobs that are assigned and having limited discretion as one of team members • To conduct jobs under instruction or control of senior workers • To conduct basic works to obtain higher abilities necessary for the job in the team

3.3.4A) SAMPLE OF CATEGORY AND TASK FOR GLOBAL CORE HUMAN RESOURCES

Type : Core Global Task (Maintenance Site Task)
Job Category : Airframe

Task : Airframe

[Outline]

The Job Category "Airframe" in aircraft maintenance business such as MROs /FBOs and airlines is consisted of a series of Tasks relating to aircraft maintenance among their job categories performed in job sites. The Airframe Job Category consists of Tasks of Airframe, Electric/Electronic Equipment and Structure. In Airframe Task, person in charge conducts inspection at maintenance/repair/ alteration, trouble shooting, disassembly, exchange of equipment/parts, assembly, exchange/replenishment of lubricant, cleaning under/with the management, control and support of the Advanced Global Task (Management Task) members.

[job Description]

- (1) In Inspection Task, Person in charge conducts inspection, visually or with proper tools, of cracks, breakages, deformations, peeling-offs, corruptions, leakages, loosening or missing of parts based on the maintenance manual, company regulations or safety instructions.
- (2) In Trouble Shooting Task, regarding the defect found in the Inspection Task, person in charge explores the real cause of the defect from the occurrence place, extent and nature of the defect, and studies and decides proper repair policy.
- (3) In Disassembly Task, Person in charge conducts disassembly of aircraft components and dismantling of equipment and parts based on the maintenance manual, company regulations or safety instructions.
- (4) In Exchange Task of equipment and parts, person in charge exchanges landing gears, hydro/pneumatic systems, cabin interiors, and other equipment and parts those found to be defective or exchanged periodically based on the maintenance manual, company regulations or safety instructions .
- (5) In Assembly Task, person in charge assembles aircraft, installs equipment and parts to aircraft based on the maintenance manual, company regulations or safety instructions.
- (6) In Task of Exchange/Replenishment of Oils, person in charge conducts exchange /refill of oils and refueling before flight.
- (7)) In Cleaning Task, person in charge conducts inside/outside cleaning of aircraft before flight and during maintenance work.

3.3.4A) SAMPLE OF CATEGORY AND TASK FOR GLOBAL CORE HUMAN RESOURCES (CONT.)

[Required knowledge, capability and experiences]

- (1) For Inspection Task; knowledge about crack, breakage, deformation, peeling-off and corrosion, and knowledge about prevention and counter measures for these defects.
- (2) For Trouble Shooting Task; knowledge about trouble shooting methodology, previous instances of failures and their real causes.
- (3) For Disassembly Task; knowledge about materials, structure, functions etc. of aircraft, equipment and parts.
- (4) For Exchange Task of Equipment and Parts; knowledge about materials, structure, functions etc. of aircraft, equipment and parts.
- (5) For Assembly Task; knowledge about materials, structure, functions etc. of aircraft, equipment and parts.
- (6) For Task of Exchange/Replenishment of Oils; knowledge about oils and lubricants used for aircraft
- (7) For Cleaning Task; knowledge about cleaning equipment and agent etc.
- (8) As prerequisites of conducting Airframe Task, common knowledge about tools and fasteners such as rivets, bolts, nuts, screws, washers, pin etc. is required.
- (9) In order to secure the safety and quality of maintenance task, common knowledge about work items and their requirements for respective inspection or maintenance specified in company regulations and safety instructions, and related laws is required.
- (10) In order to conduct maintenance task, common knowledge to read, understand the contents of maintenance manuals written in English, and to perform the work specified is required.
- (11) In order to conduct maintenance task smoothly, common knowledge about coping with troubles of tools and facilities is required.
- (12) Capability and experience of executing the tasks using expert knowledge of Airframe are required.
- (13) To perform Airframe Task, it is necessary to keep smoother communications with the persons in side and out side company, capabilities related to communication, personal skills and "Identity" are required.
- (14) It is strongly required to keep the safety of aircraft on which many crews and passengers rely, knowledge on human factors and capability of situation assessment and problem solving are required.

[Related licenses, qualifications and/or certificates]

- Licenses issued by state; Aircraft Maintenance Technician, Aircraft Line Maintenance Technician, Aircraft Overhaul Technician, Aircraft Radiotelephone Operator
- Public Qualifications; JIS Z 2305 Non-destructive inspection engineer tests

3.3.1B OVERALL VIEW OF JOB FOR ADVANCED HUMAN RESOURCES (MANAGEMENT JOB)

Type	Category	Task	Outline of Job
Advanced Global Task (Management Work)	Management	General Affairs	General Affairs, Human Affairs, Labor Administration, legal, Stock Management, Document Management, Internal Administration, External Affairs, Public Relations
		Planning	Supporting of corporate strategy setting, Strategy management, Supporting of corporate top management, Vitalization of corporate , Drawing up of next generation business and technologies, Innovation in corporate management system etc.
		Financial Affairs	Fund raising, Fund operation, Cash and deposits transaction, Statement of cash receipts and disbursement, Analysis of business, Financial accounting, Tax accounting
		Marketing	Sales control, Sales activities
		Logistics	Procurement strategy, Procurement planning, Procurement Management
		Safety Management	Setting up of safety Management regulations, Safety management, Risk management
	Engineering	Production	Maintenance/production planning, Planning and control of order acceptance and order placement, Planning and control of plant and facility, Planning and control of system, Supporting of aircraft operation control
		Technology	Technological assistance to Core Human resources at maintenance site, Engineering planning, Technology development, Engineering support, Quality management of group, matters related to human factors, External affairs relating to technologies
		Training	Design of Education/training based on human resource strategy, Specialized and basic Education, Education/training planning and execution
		Quality Assurance	Design of total quality assurance program, quality control, Evaluation of business performance of group, Audit, Correspondence to supervisory agencies

3.3.2B) REQUIRED LEVELS FOR ADVANCED HUMAN RESOURCES (MANAGEMENT JOB)

Type	Tasks for Advanced Global Human Resources (Management)
Categories	Management/Engineering
Level 4 control overall business	<p>Required level of capability;</p> <ul style="list-style-type: none"> • to make integrated judgement and decisions aspiring total optimization of the company as a senior level of officer of management/engineering division, and lead the company for the creation of corporate profit
Level 3 Manage & instruct junior staff	<p>Required level of capability;</p> <ul style="list-style-type: none"> • To set up management plan along with the sectoral policy and to preside own team or operation as the responsible person of management/engineering division • To negotiate with manufactures and customers, and come to a settlement • To instruct and lead junior staffs or maintenance line workers
Level 2 Conduct own job independently	<ul style="list-style-type: none"> • To conduct own job with self decision having innovative and originality mind as the person in charge of management/engineering division • To conduct own job independently supporting senior staffs and as a team member of working team
Level 1 Conduct own job with supervision by seniors	(Level 1 is not assumed for these job categories)

3.3.3B) SAMPLE OF CATEGORY AND TASK FOR GLOBAL ADVANCED HUMAN RESOURCES

Type: Advanced Global Task (Management Task)

Job Category: Engineering

Task: Technology

[Outline]

The job category "Engineering" in aircraft maintenance business such as MROs/FBOs and airlines is to support top management people from engineering side and consisted of a series of Tasks such as Production, Technology, Training and Quality Assurance.

The Tasks of "Technology" personnel include to provide Technical Supports to the Global Core human resources responsible for aircraft maintenance at job site, to set Engineering Planning for aircraft maintenance, Technology Development, Technology Management, Engineering Support, Quality Management of group, matters related to Human Factors and External Affairs relating to technologies

[Job Description]

- (1) In "Engineering Planning", tasks include to preside engineering system, set up total planning and coordinate technology matters. Tasks include to establish and manage rules and regulations regarding technological matters, and further to make mid to long range plans relating to technologies considering aircraft technology development trend.
- (2) In "Technology Development", tasks include to research and study new technology or basic technology including those of environmental issues regarding the maintenance and repair of aircraft and equipment. Further, the tasks include to cooperate with manufacturers and operators in technological matters.
- (3) In "Technology Management", tasks include to develop operating standards relating to aircraft maintenance that comply with Civil Aeronautics Act or Aircraft Manufacturing Industry Act and to issue technical job orders. Further the tasks include to seek the cause and set up permanent measures for critical failures.
- (4) In "Engineering Support", tasks include to provide technological support to Global Core Human Resources, manufacturers and affiliated maintenance companies.
- (5) In "Quality Management", tasks include to develop the policy and standards of the quality control, to support the responsible section in case of on-site inspections by supervisory agencies.
- (6) In "Human Factor", tasks include to study and set up the policy relating to human factors such as quality of job, work safety etc. The tasks further include to support the responsible section for submission of necessary reports to supervisory agencies.
- (7) In "External Affairs", tasks include to negotiate and coordinate with manufacturers and affiliated maintenance companies relating to technological issues.

3.3.3B) SAMPLE OF CATEGORY AND TASK FOR GLOBAL ADVANCED HUMAN RESOURCES (CONT.)

[Required knowledge, capability and experiences]

- (1) For "Engineering Planning " task; Knowledge about the structure, materials, manufacturing process of each aircraft, latest technologies, tools, equipment, facilities of maintenance and repair is required.
- (2) For "Technology Development" task; Knowledge about the latest trends of aircraft maintenance and repair technologies and instances of environmental issues relating to maintenance and repair is required.
- (3) For "Technology Management" task; Knowledge about the Civil Aeronautics Act or Aircraft Manufacturing Industry Act, foreign laws and regulations set by FAA or EASA, and the instances of critical failures of the past.
- (4) For "Engineering Support" task; Knowledge about the rules and regulations for maintenance of own company, operators, affiliated maintenance companies etc.
- (5) For "Quality Management" task; Knowledge about the quality standards, past instances of on-site investigations by supervisory agencies.
- (6) For "Human Factor" task; Knowledge about the latest research and study results of human factors.
- (7) For "External Affairs" task; Knowledge about the past technological issues and troubles, and solution for such issues and troubles.
- (8) To support the maintenance site sections technologically, knowledge about electric, electronics, mechanics and materials etc. necessary for aircraft maintenance, and common knowledge of aircraft operation necessary for aircraft maintenance business.
- (9) Capabilities and experiences of conducting engineering tasks utilizing domain knowledge are required.
- (10) Capabilities relating to communication, personal skills and Identities are required because it is necessary to submit proposals to or coordinate with the person in and out of company keeping a smoother communication.
- (11) It is strongly required to keep the safety, from engineering side, of aircraft on which many crews and passengers rely, knowledge on human factors and capability of situation assessment and problem solving are required.

[Related licenses, qualifications and/or certificates]

- Licenses issued by state; Aircraft Maintenance Technician, Aircraft Line Maintenance Technician, Aircraft Overhaul Technician, Aircraft Radiotelephone Operator
- Public Qualifications; Master of MOT

4A) POINTS OF CURRICULUM FOR GLOBAL CORE MAINTENANCE HUMAN RESOURCE DEVELOPMENT (TENTATIVE)

- Current curriculum of aviation college needs, at the time of alteration to accommodate the development of global core human resources, to enhance the subjects related to;
 - English and communication
 - Human factors
- To realize this curriculum modification, efficiency of education must be improved.

It is necessary to positively study the introduction of e-learning, utilization of simulators etc. for such improvement.

4B) CURRICULUM SCHEME FOR GLOBAL ADVANCED MAINTENANCE HUMAN RESOURCE DEVELOPMENT (TENTATIVE)

- A draft of curriculum scheme for 2-year Professional Graduate School to foster Global Advanced Human Resources

Program	Course	Domains for Candidate Subjects	Classification	Credits
Aircraft Maintenance Management	Aircraft Maintenance Engineering Management * Equivalent to MOT Core Course relating to aircraft Maintenance	<ul style="list-style-type: none"> Management of Technology (Overview) Innovation Starting up Business/New Business development Technology/Research & Development Production/Maintenance Risk Management Human Factor Intellectual Property Rights/Standardization History of Technology Business Process Management (Engineering) 	Elective compulsory	28
	Common Subjects	<ul style="list-style-type: none"> Ethics for Engineers Business Strategy 		
	Aircraft Maintenance Business Management * Equivalent to MBA Core Course relating to aircraft Maintenance	<ul style="list-style-type: none"> Business Management Organization Information Finance/Accounting Marketing Governmental Policy/Legal Affairs Institutional affairs/Standard Industry Economy (Macro/Micro) Business Process Management (Management) 	Elective compulsory	
Pragmatic Education		<ul style="list-style-type: none"> Project Based Learning (PBL) 	Compulsory	12

SUMMARY

● Outcomes from FY 2014 Activities

- Project Activity Report of FY 2014 that contains;
 1. Report of Research Activities
 - a. Conducted hearings to operators, Maintenance companies, Universities/ Aviation Colleges, Aviation Industrial Association, etc.
 - b. Conducted researches on Curricula of Aeronautical Engineering and maintenance technologies
 - c. Conducted researches on skill standards
 2. Development Activities
 - a. Developed skill standard for MRO/FBO Advanced/Core Global Human Resources
 - b. Developed Outline of Curriculum






● Dissemination of the Results

1. Distributed Project Activity Report of FY 2014 to;
 - Committee members
 - Related education institutes
 - Related industrial associations and companies
2. Released digital data (PDF format) of the report on AIIT Web Site

● Plans following to FY 2015

1. Completion of Skill Standard for Global MRO/FBO Human resources
2. To give a concrete shape and materialize the curriculum, and evaluation of it
3. Pre-evaluation, procurement, development and evaluation of course materials

4. PLANNED ACTIVITIES BEYOND FY 2015

FY 2015				FY 2016				FY2017
1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	
Development of Education Program (Completion of Skill Standard, Shaping curriculum, Pre-evaluation/Procurement of course materials)				Evaluation of Developed Program (Evaluation of curriculum, Development and evaluation of course materials)				Applica- tion
 1. Fulfilling Skill Standard (Jul - Oct)								
 2. Curriculum Design (Sep - Dec)				 1. Evaluation of Curriculum (Jul - Oct.)				
 3. Evaluation of OTS Educational Materials and procurement (Sep - Feb)				 2. Development of Educational Materials and Evaluation (Sep - Feb)				

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