ตารางแสดงรายละเอียดการแก้ไข คู่มือมาตรฐานการบริการการเดินอากาศ ด้านอุตุนิยมวิทยาการบิน

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Chapter 1 Introduction		
1.1.7 Related Documents 1.1.7.1 These standards should be read in conjunction with: a) Civil Aviation Authority of Thailand Regulations and Requirements; b) ICAO Annex 3: Meteorological Service for International Air Navigation; c) ICAO Annex 10: Aeronautical Telecommunications, Volume II – Communications Procedures; d) ICAO Annex 11: Air Traffic Services (MET related issues only); e) ICAO Annex 15: Aeronautical Information Services (MET related issues only); f) ICAO Annex 19: Safety Management System; g) ICAO Manual of Aeronautical Meteorological Practice (Doc 8896); h) ICAO Manual on coordination between Air Traffic Services Aeronautical Information Services and Meteorological Services (Doc 9377); i) ICAO Manual of Runway Visual Range Observing and Reporting Practices j) (Doc 9328); k) ICAO Manual on Low Level Wind-shear (Doc 9817); l) ICAO Manual on Automatic Meteorological Observing Systems at Aerodromes (Doc 9837); m) ROBEX HANDBOOK n) ASIA/PACIFIC REGIONAL SIGMET GUIDE o) WMO Technical Regulations on General Meteorological Standards and Recommended Practices (WMO No 49, Volume I); and AIP-Thailand.	**1.1.7 Related Documents** 1.1.7.1 These standards should be read in conjunction with: a) Civil Aviation Authority of Thailand Regulations and Requirements; b) ICAO Annex 3: Meteorological Service for International Air Navigation; c) ICAO Annex 10: Aeronautical Telecommunications, Volume II – Communications Procedures; d) ICAO Annex 11: Air Traffic Services (MET related issues only); e) ICAO Annex 15: Aeronautical Information Services (MET related issues only); f) ICAO Annex 19: Safety Management System; g) ICAO Manual of Aeronautical Meteorological Practice (Doc 8896); h) ICAO Manual on coordination between Air Traffic Services Aeronautical Information Services and Meteorological Services (Doc 9377); i) ICAO Manual of Runway Visual Range Observing and Reporting Practices (Doc 9328); j) ICAO Manual on Low Level Wind-shear (Doc 9817); k) ICAO Manual on Automatic Meteorological Observing Systems at Aerodromes (Doc 9837); l) ICAO Manual on Procedures for Air Navigation Services — Meteorology (PANS-MET, Doc 10157) m) ROBEX HANDBOOK n) ASIA/PACIFIC REGIONAL SIGMET GUIDE o) WMO Technical Regulations on General Meteorological Standards and Recommended Practices (WMO-No. 49, Volume I); p) WMO Guide to Implementation of Education and Training Standards in Meteorology and Hydrology (WMO-No. 1083, Volume I); and	เพิ่มเอกสารที่เกี่ยวข้องเนื่องจากมีการประกาศใช้ PANS-MET WMO No. 1083

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	q) AIP-Thailand.	
1.2 Definitions and Abbreviations 1.2.1 Definitions	**1.2 Definitions and Abbreviations** 1.2.1 Definitions	- แก้ไขคำนิยามให้ตรงกับใน Annex 3 และ PANS-MET - ตัดออกตาม Annex 3 และไม่มีกำหนดเป็น Definitions ใน PANS-MET
Aerodrome climatological summary - Concise summary of specified meteorological elements an aerodrome, based on statistical data.	Aerodrome climatological summary - Concise summary of specified meteorological elements at an aerodrome, based on statistical data.	
Aeronautical fixed telecommunication network (AFTN) - A worldwide system of aeronautical fixed circuits provided, as part of the aeronautical fixed service, for the exchange of messages and/or digital data between aeronautical fixed stations having the same or compatible communications characteristics.	~~**Aeronautical fixed telecommunication network (AFTN)** - A worldwide system of aeronautical fixed circuits provided, as part of the aeronautical fixed service, for the exchange of messages and/or digital data between aeronautical fixed stations having the same or compatible communications characteristics.~~	
Aeronautical meteorological Personnel (AMP) - Aeronautical meteorological Personnel (AMP) refers to the Aeronautical Meteorological Forecaster (AMF), Aeronautical Meteorological Observer (AMOB) and Aeronautical Meteorological Technician (AMT) whose duties and responsibilities support aeronautical meteorological services.	**Aeronautical meteorological Personnel (AMP)** - Aeronautical meteorological Personnel (AMP) refers to the Aeronautical Meteorological Forecaster (AMF), Aeronautical Meteorological Observer (AMOB) ~~and Aeronautical Meteorological Technician (AMT)~~ whose duties and responsibilities support aeronautical meteorological services.	
Area navigation (RNAV) - A method of navigation which permits aircraft operations on any desired flight path within the coverage of ground- or space-based navigation aids or within the limits of the capability of self-contained aids, or a combination of these. *Note. — Area navigation includes performance-based navigation as well as other operations that do not meet the definition of performance-based navigation*	~~**Area navigation (RNAV)** - A method of navigation which permits aircraft operations on any desired flight path within the coverage of ground- or space-based navigation aids or within the limits of the capability of self-contained aids, or a combination of these.~~ ~~*Note. — Area navigation includes performance-based navigation as well as other operations that do not meet the definition of performance-based navigation.*~~	
Extended range operation - Any flight by an aeroplane with two turbine engines where the flight time at the one engine inoperative cruise speed (in ISA and still air conditions), from a point on the route to an adequate alternate aerodrome, is greater than the threshold time approved by the State of the Operator.	~~**Extended range operation** - Any flight by an aeroplane with two turbine engines where the flight time at the one engine inoperative cruise speed (in ISA and still air conditions), from a point on the route to an adequate alternate aerodrome, is greater than the threshold time approved by the State of the Operator.~~	
International airways volcano watch (IAVW) - International arrangements for monitoring and providing warnings to aircraft of volcanic ash in the atmosphere.	**International airways volcano watch (IAVW)** - International arrangements for monitoring volcanic activity and providing notices, forecasts and warnings to aircraft of volcanic ash in the atmosphere.	

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Note. — The IAVW is based on the cooperation of aviation and non-aviation operational units using information derived from observing sources and networks that are provided by States. The watch is coordinated by ICAO with the cooperation of other concerned international organizations.	*Note. — The IAVW is based on the cooperation of aviation and non-aviation operational units using information derived from observing sources and networks that are provided by States. The watch is coordinated by ICAO with the cooperation of other concerned international organizations.*	
Meteorological authority - The authority providing or arranging for the provision of meteorological service for international air navigation on behalf of a Contracting State.	**Meteorological authority** - The ~~authority providing or~~ entity arranging for the provision of meteorological service for international air navigation on behalf of a Contracting State, and providing regulation and oversight of the meteorological service.	
	Meteorological service provider - The relevant entity designated to provide meteorological service for international air navigation on behalf of a Contracting State.	
Meteorological satellite - An artificial Earth satellite making meteorological observations and transmitting these observations to Earth.	~~**Meteorological satellite** - An artificial Earth satellite making meteorological observations and transmitting these observations to Earth.~~	
	Meteorological Instrument Technician (MIT) - A person who responsible for some duties such as maintenance, repairing, or calibration the meteorological equipment.	
Navigation specification - A set of aircraft and flight crew requirements needed to support performance-based navigation operations within a defined airspace. There are two kinds of navigation specifications: a) Required navigation performance (RNP) specification. A navigation specification based on area navigation that includes the requirement for performance monitoring and alerting, designated by the prefix RNP, e.g. RNP 4, RNP APCH. b) Area navigation (RNAV) specification. A navigation specification based on area navigation that does not include the requirement for performance monitoring and alerting, designated by the prefix RNAV, e.g. RNAV 5, RNAV 1. *Note. — The Performance-based Navigation (PBN) Manual (Doc 9613), Volume II, contains detailed guidance on navigation specifications.*	~~**Navigation specification** - A set of aircraft and flight crew requirements needed to support performance-based navigation operations within a defined airspace. There are two kinds of navigation specifications:~~ ~~a) Required navigation performance (RNP) specification. A navigation specification based on area navigation that includes the requirement for performance monitoring and alerting, designated by the prefix RNP, e.g. RNP 4, RNP APCH.~~ ~~b) Area navigation (RNAV) specification. A navigation specification based on area navigation that does not include the requirement for performance monitoring and alerting, designated by the prefix RNAV, e.g. RNAV 5, RNAV 1.~~ ~~*Note. — The Performance-based Navigation (PBN) Manual (Doc 9613), Volume II, contains detailed guidance on navigation specifications.*~~	

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Operational control - The exercise of authority over the initiation, continuation, diversion or termination of a flight in the interest of the safety of the aircraft and the regularity and efficiency of the flight.	~~**Operational control** - The exercise of authority over the initiation, continuation, diversion or termination of a flight in the interest of the safety of the aircraft and the regularity and efficiency of the flight.~~	
Operational flight plan - The operator's plan for the safe conduct of the flight based on considerations of aeroplane performance, other operating limitations and relevant expected conditions on the route to be followed and at the aerodromes concerned.	~~**Operational flight plan** - The operator's plan for the safe conduct of the flight based on considerations of aeroplane performance, other operating limitations and relevant expected conditions on the route to be followed and at the aerodromes concerned.~~	
Performance-based navigation (PBN) - Area navigation based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in a designated airspace. *Note. — Performance requirements are expressed in navigation specification (RNAV specification, RNP specification) in terms of accuracy, integrity, continuity, availability and functionality needed for the proposed operation in the context of a particular airspace concept.*	~~**Performance-based navigation (PBN)** - Area navigation based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in a designated airspace.~~ ~~*Note. — Performance requirements are expressed in navigation specification (RNAV specification, RNP specification) in terms of accuracy, integrity, continuity, availability and functionality needed for the proposed operation in the context of a particular airspace concept.*~~	
Reporting point - A specified geographical location in relation to which the position of an aircraft can be reported.	~~**Reporting point** - A specified geographical location in relation to which the position of an aircraft can be reported.~~	
Space weather centre (SWXC) - A centre designated to monitor and provide advisory information on space weather phenomena expected to affect high-frequency radio communications, communications via satellite, GNSS-based navigation and surveillance systems and/or pose a radiation risk to aircraft occupants. *Note. — A space weather centre is designated as global and/or regional.*	**Space weather centre (SWXC)** - A global or regional centre designated by ICAO to monitor and provide advisory information on space weather phenomena expected to affect high-frequency radio communications, communications via satellite, GNSS-based navigation and surveillance systems and/or pose a radiation risk to aircraft occupants, under the framework of space weather information service. *Note. — A regional centre designated by ICAO supports global centres in the fulfilment of its responsibilities.*~~*A space weather centre is designated as global and/or regional.*~~	
	Space weather information service - A globally coordinated service where space weather centres provide information on space weather phenomena that may affect communications, navigation and surveillance systems and/or pose a radiation risk to aircraft occupants.	

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State volcano observatory - A volcano observatory, designated by regional air navigation agreement, to monitor active or potentially active volcanoes within a State and to provide information on volcanic activity to its associated area control centre/flight information centre, meteorological watch office and volcanic ash advisory centre.	**State volcano observatory** - A volcano observatory, designated by regional air navigation agreement, to monitor active or potentially active volcanoes within a State and to provide information on volcanic activity and/or volcanic ash in the atmosphere ~~to its associated area control centre/flight information centre, meteorological watch office and volcanic ash advisory centre~~.	
Upper-air chart - A meteorological chart relating to a specified upper-air surface or layer of the atmosphere.	~~**Upper-air chart** - A meteorological chart relating to a specified upper-air surface or layer of the atmosphere.~~	
1.2.3 Terms used with a limited meaning For the purpose of this MET MOS, the following terms are used with a limited meaning as indicated below: a) to avoid confusion in respect of the term "service" between the meteorological service considered as an administrative entity and the service which is provided, "meteorological authority" is used for the former and "service" for the latter; b) "provide" is used solely in connection with the provision of service; c) "issue" is used solely in connection with cases where the obligation specifically extends to sending out the information to a user; d) "make available" is used solely in connection with cases where the obligation ends with making the information accessible to a user; and e) "supply" is used solely in connection with cases where either c) or d) applies.	**1.2.3 Terms used with a limited meaning** For the purpose of this MET MOS, the following terms are used with a limited meaning as indicated below: ~~a) to avoid confusion in respect of the term "service" between the meteorological service considered as an administrative entity and the service which is provided, "meteorological authority" is used for the former and "service" for the latter;~~ a) "provide" is used solely in connection with the provision of service; b) "issue" is used solely in connection with cases where the obligation specifically extends to sending out the information to a user; c) "make available" is used solely in connection with cases where the obligation ends with making the information accessible to a user; and d) "supply" is used solely in connection with cases where either ~~c~~b) or ~~d~~c) applies.	

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Chapter 2 operations Manual		
2.2 Content of the Operations Manual 2.2.1 An operations manual shall contain: a) a table contains based on the items in the manual, including the page number on which each item begins; b) a description of the provider's organizational structure and a statement setting out the functions that the provider performs, or proposed to perform; c) a description of the chain of command established, or proposed to be established, by the provider and a statement of the duties and responsibilities of any positions within the organizational structure; d) a statement showing how the provider determines the number of operational staff; e) a list of the aeronautical meteorological services that the provider provides, or proposes to provide including service type (e.g. aeronautical meteorological station service, aerodrome meteorological office service and/or meteorological watch office service) scope and/or location and operation hours; f) a statement of the job description for each operating position; g) a description of the processes and documentation used to present to staff the relevant standards, rules and procedures contained in Manual of Standards, ICAO Annexes 3, ICAO DOC 8896, etc. And any of the provider's site specific instructions for the provision aeronautical meteorological services; h) a description of the processes and documentation used to provide operational instructions to staff; i) a description of facilities and equipment used for providing aeronautical meteorological services; j) a copy of any agreement entered into by the provider in relation to the provision of any of the aeronautical meteorological services;	2.2 Content of the Operations Manual 2.2.1 An operations manual shall contain: a) a table contains based on the items in the manual, including the page number on which each item begins; b) a description of the provider's organizational structure and a statement setting out the functions that the provider performs, or proposed to perform; c) a description of the chain of command established, or proposed to be established, by the provider and a statement of the duties and responsibilities of any positions within the organizational structure; d) a statement showing how the provider determines the number of operational staffs required to perform the aeronautical meteorological service; e) a list of the aeronautical meteorological services that the provider provides, or proposes to provide including service type (e.g. aeronautical meteorological station service, aerodrome meteorological office service and/or meteorological watch office service) scope and/or location and operation hours; f) a statement of the job description for each operating position; g) a description of the processes and documentation used to present to staff the relevant standards, rules and procedures contained in Manual of Standards, ICAO Annexes 3, ICAO DOC 8896, etc. And any of the provider's	2.2.1 d) เพิ่มโดยปรับจาก Chapter 4, 4.2.6

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k) a copy of the document that sets out the provider's quality management system include safety management; l) a copy of the provider's contingency plan; m) a description of the provider's training program; n) a description of the procedures that ensure that all equipment, including software, is operated in accordance with the manufacturer's operating instructions and manuals; o) the procedures to be followed for revising the operations manual; p) a description of the provider's document control and record keeping system; q) a copy of the provider's security program; r) a description of the procedures to be followed to ensure all operational staff are familiar with any operational changes that have been issued since they last performed operational duties.	site specific instructions for the provision aeronautical meteorological services; h) a description of the processes and documentation used to provide operational instructions to staff; i) a description of facilities and equipment used for providing aeronautical meteorological services; j) a copy of any agreement entered into by the provider in relation to the provision of any of the aeronautical meteorological services; k) a copy of the document that sets out the provider's quality management system include safety management; l) a copy of the provider's contingency plan; m) a description of the provider's training program; n) a description of the procedures that ensure that all equipment, including software, is operated in accordance with the manufacturer's operating instructions and manuals; o) the procedures to be followed for revising the operations manual; p) a description of the provider's document control and record keeping system; q) a copy of the provider's security program; r) a description of the procedures to be followed to ensure all operational staff are familiar with any operational	

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Chapter 3 General Provisions for Aeronautical Meteorological Services		
3.2 Meteorological data and information. ... 3.2.4 Owing to the variability of meteorological elements in space and time, to limitations of observing techniques and to limitations caused by the definitions of some of the elements, the specific value of any of the elements given in a report shall be understood by the recipient to be the best approximation to the actual conditions at the time of observation. *Note. — Guidance on the operationally desirable accuracy of measurement or observation is given in ICAO Annex 3, Attachment A.* 3.2.5 Owing to the variability of meteorological elements in space and time, to limitations of forecasting techniques and to limitations caused by the definitions of some of the elements, the specific value of any of the elements given in a forecast shall be understood by the recipient to be the most probable value which the element is likely to assume during the period of the forecast. Similarly, when the time of occurrence or change of an element is given in a forecast, this time shall be understood to be the most probable time. *Note. — Guidance on the operationally desirable accuracy of forecasts is given in ICAO Annex 3, Attachment B.* ...	**3.2 Meteorological data and information:** ... 3.2.4 Owing to the variability of meteorological elements in space and time, to limitations of observing techniques and to limitations caused by the definitions of some of the elements, the specific value of any of the elements given in a report shall be understood by the recipient to be the best approximation to the actual conditions at the time of observation. *Note. — Guidance on the operationally desirable accuracy of measurement or observation is ~~given~~ contained in PANS-MET (Doc 10157) ~~ICAO Annex 3~~, Attachment A.* 3.2.5 Owing to the variability of meteorological elements in space and time, to limitations of forecasting techniques and to limitations caused by the definitions of some of the elements, the specific value of any of the elements given in a forecast shall be understood by the recipient to be the most probable value which the element is likely to assume during the period of the forecast. Similarly, when the time of occurrence or change of an element is given in a forecast, this time shall be understood to be the most probable time. *Note. — Guidance on the operationally desirable accuracy of forecasts is ~~given~~ contained in PANS-MET (Doc 10157) ~~ICAO Annex 3~~, Attachment B.* ... 3.2.7 MET service provider should ensure that the meteorological information supplied to the users listed in 3.2.2 is provided through information services. *Note 1.— In the context of system-wide information management (SWIM), the notion of information service addresses machine-to-machine*	ปรับให้ตรงกับ Annex 3 Amendment ปัจจุบัน

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	interaction in a service-oriented architecture. *Note 2.— Procedures on information services are contained in the Procedures for Air Navigation Services Information Management (PANS-IM, Doc 10199).* *Note 3.— Guidance material on information services can be found in the Manual on System-wide Information Management Implementation (Doc 10203).*	
3.5 Notifications Required from Operators 3.5.1 An operator requiring meteorological service or changes in existing meteorological service shall notify MET service provider or concerned aerodrome meteorological, sufficiently in advance. The minimum amount of advance notice required shall be as agreed between MET service provider and the operator concerned. 3.5.2 MET service provider shall be notified by the operator requiring service when: a) new routes or new types of operations are planned; b) changes of a lasting character are to be made in scheduled operations; and other changes, affecting the provision of meteorological service, are planned such information shall contain all details necessary for the planning of appropriate arrangements by MET service provider.	**3.5 Notifications Required from Operators** 3.5.1 An operator requiring meteorological service or changes in existing meteorological service shall notify, sufficiently in advance, MET service provider ~~or~~ concerned ~~aerodrome meteorological~~, ~~sufficiently in advance~~. The minimum amount of advance notice required shall be as agreed between MET service provider or aerodrome meteorological office and the operator concerned. 3.5.2 MET service provider shall be notified by the operator requiring service when: a) new routes or new types of operations are planned; b) changes of a lasting character are to be made in scheduled operations; and c) other changes, affecting the provision of meteorological service, are planned. ~~such information shall contain all details necessary for the planning of appropriate arrangements by MET service provider.~~ Such information shall contain all details necessary for the planning of appropriate arrangements by MET service provider.	แก้ไขให้ตรงกับ Statement ของ Annex 3
Chapter 4 Human Resource Management		
4.2 Requirements 4.2.1 MET service provider shall systematically address human resources management in the following key aspects:	**4.2 ~~Requirements~~ Human Resource Management** 4.2.1 MET service provider shall systematically address human resources management in the following key aspects:	- 4.2.1 c) ตัด watch ออก เนื่องจากไม่มีความชัดเจน

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a) management responsibilities and accountabilities; b) staff deployment; c) operational watch rostering; and d) operational support arrangements.	a) management responsibilities and accountabilities; b) staff deployment; c) operational ~~watch~~ rostering; and d) operational support arrangements.	- ตัดข้อความของ 4.2.2 ย้ายไปใน Chapter 8, 8.1.2 และปรับข้อความใหม่ - แก้ไข 4.2.3 โดยตัดเนื้อหามาจาก Chapter 6, 6.1.2 และ 6.1.3 และเพิ่มให้ครอบคลุมช่างอุตุนิยมวิทยา - เพิ่ม 4.2.4 แก้ไขข้อความเพื่อให้เกิดความชัดเจนในเรื่องอัตรากำลัง - ตัดข้อความ 4.2.6 และปรับข้อความไปไว้ใน Chapter 2, 2.2.1 d) - 4.2.7 ● ปรับข้อความเพื่อความชัดเจนในเรื่องของการจัดทำตารางเวร ● เพิ่ม operation hours เป็น 1 ใน factor 4.2.8 ปรับเป็น Shall ให้สอดคล้องกับประกาศนิติฯ ข้อ 6 (5)
4.2.2 MET service provider should identify the key personnel responsible for the quality management to conduct of the MET services. Organization chart should be clearly defined and provide the specific positions, responsibilities, functions, accountabilities and authorities.	4.2.2 ~~MET service provider should identify the key personnel responsible for the quality management to conduct of the MET services. Organization chart shall should be clearly defined and provide the specific positions, responsibilities, functions, accountabilities and authorities.~~ MET service provider shall document the structure and internal organization with a level of detail according to ~~the size and complexity of~~ the organization.	
4.2.3 MET services provider shall establish and develop job descriptions for Aeronautical Meteorological Personnel.	4.2.3 ~~MET services provider shall establish and develop job descriptions for Aeronautical Meteorological Personnel.~~ MET service provider shall develop a job description for Aeronautical Meteorological Personnel (AMP) and Meteorological Instrument Technician (MIT).	
4.2.4 MET services provider shall document and define the method of determining staffing levels to ensure safe and efficient MET operations.	4.2.4 The job description shall depict the job purpose, key responsibilities, and outcome to be achieved of each AMP. ~~Initial and periodic assessments shall be established that require personnel to demonstrate the required competencies.~~	
4.2.5 MET services provider shall deploy sufficient number of personnel to provide meteorological services for air navigation at the MET service units.	4.2.5~~4~~ MET services provider shall document and define the method of determining ~~staffing levels~~ manpower to ensure safe and efficient ~~MET~~ the operation of meteorological services.	
4.2.6 MET service provider shall employ sufficient number of competent Aeronautical Meteorological Personnel to perform the operation of the service. MET service provider shall provide in the operations manual an analysis of the number of personnel required to perform the aeronautical meteorological service taking into account the duties and workload required.	~~4.2.5 MET services provider shall deploy sufficient number of personnel to provide meteorological services for air navigation at the MET service units.~~	
4.2.7 MET service provider shall plan the level of Aeronautical Meteorological Personnel requirements taking into account the following factors: a) rest days between shifts; b) limits on night shifts;	4.2.6 MET service provider shall employ sufficient number of competent AMP ~~Aeronautical Meteorological Personnel~~ to perform the operation of meteorological services for air	

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c) interval after night shifts; d) leave and holidays requirements; and e) sick leave reserve. 4.2.8 MET service provider should develop policies and procedures to enable recruitment and retention of adequate Aeronautical Meteorological Personnel.	navigation at the MET service units ~~to perform the operation of the service. MET service provider shall provide in the operations manual an analysis of the number of personnel required to perform the aeronautical meteorological service taking into account the duties and workload required.~~ 4.2.7 MET service provider shall ~~plan~~ arrange the operational rostering ~~level of Aeronautical Meteorological Personnel requirements~~ taking into account the following factors: a) operation hours; b) the number of AMP; c) training requirements; d) rest time requirements~~days between shifts~~; ~~e) limits on night shifts;~~ ~~f) interval after night shifts;~~ g) leave ~~and holidays~~ requirements; and h) sick leave reserve. 4.2.8 MET service provider ~~should~~ shall develop policies and procedures to enable recruitment and retention of adequate Aeronautical Meteorological Personnel.	
Chapter 5 Personnel		
5.1 General 5.1.1 This Chapter sets out the standards, requirements pertaining to the aeronautical meteorological personnel. 5.1.2 MET service provider shall keep records of the qualifications of all personnel involved in the provision of aeronautical meteorological for air navigation. 5.1.3 MET service provider shall ensure that AMP complies with the requirements of the World Meteorological Organization (WMO) in respect of qualifications, competencies, education and training of	**5.1 General** 5.1.1 This Chapter sets out the standards, requirements pertaining to the aeronautical meteorological personnel (AMP) and meteorological instrument technician (MIT). 5.1.2~~3~~ MET service provider shall ensure that AMP complies with the requirements of the World Meteorological Organization (WMO) in respect of qualifications, competencies, education and training of meteorological personnel providing service for international air navigation.	เพิ่มเรื่องการกำหนดคุณสมบัติของช่างเทคนิค

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meteorological personnel providing service for international air navigation. *Note 1.— Requirements concerning the qualifications, competencies, education and training of meteorological personnel in aeronautical meteorology are given in the Technical Regulations (WMO-No. 49), Volume I — General Meteorological Standards and Recommended Practices, Part V — Qualifications and Competencies of Personnel Involved in the Provision of Meteorological (Weather and Climate) and Hydrological Services, Part VI — Education and Training of Meteorological Personnel, and Appendix A — Basic Instruction Packages.* *Note 2.— WMO Publication 1083 Guide to the Implementation of Education and Training Standards in Meteorology and Hydrology, Volume I – Meteorology.*	*Note 1.— Requirements concerning the qualifications, competencies, education and training of meteorological personnel in aeronautical meteorology are given in the Technical Regulations (WMO-No. 49), Volume I — General Meteorological Standards and Recommended Practices, Part V — Qualifications and Competencies of Personnel Involved in the Provision of Meteorological (Weather and Climate) and Hydrological Services, Part VI — Education and Training of Meteorological Personnel, and Appendix A — Basic Instruction Packages.* *Note 2.— WMO ~~Publication~~ No. 1083 Guide to the Implementation of Education and Training Standards in Meteorology and Hydrology, Volume I – Meteorology.* ~~5.1.32 MET service provider shall keep records of the qualifications of all AMP personnel involved in the provision of aeronautical meteorological for air navigation.~~ 5.1.3 The MET service provider shall establish appropriate minimum qualification requirements for MIT.	
5.2 Categories of personnel 5.2.1 The aeronautical meteorological personnel (AMP) shall be classified as follows: a) Aeronautical Meteorological Forecaster (AMF); A person who has successfully completed the requirement of the Basic Instruction Package for Meteorologist at university degree level. b) Aeronautical Meteorological Technician (AMT) or Aeronautical Meteorological Observer (AMOB); A person who has successfully completed the requirements of the Basic Instruction Package for Meteorological Technician.	**5.2 Categories of personnel** 5.2.1 The ~~aeronautical meteorological personnel (AMP)~~ shall be classified as follows: a) Aeronautical Meteorological Forecaster (AMF); ~~A person who has successfully completed the requirement of the Basic Instruction Package for Meteorologist at university degree level.~~ A qualified person who responsible for preparing and issuing forecasts and warnings of hazardous meteorological phenomena affecting aviation operations. b) ~~Aeronautical Meteorological Technician (AMT) or~~ Aeronautical Meteorological Observer (AMOB); ~~A person who has successfully completed the requirements of the Basic Instruction Package for Meteorological Technician.~~ A qualified person who responsible for observation and report	- ตัด Aeronautical Meteorological Technician (AMT) ออก เนื่องจาก WMO มีการกำหนด Aeronautical Meteorological Personnel เฉพาะแค่ AMF และ AMOB - ปรับข้อ 5.2.1 a) และ b) ให้มีเนื้อหาที่ชัดเจน และได้นำไปไว้ใน 5.3.2 ใหม่ และ 5.3.3 ใหม่ - เพิ่ม 5.2.2 นิยาม Meteorological Technician

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	meteorological conditions in order to support flight operations. 5.2.2 Meteorological Instrument Technician (MIT); A person who responsible for some duties such as maintenance, repairing, or calibration the meteorological equipment. 5.2.3 If the MET services provider has contracted MIT from sub-contractor to perform duties as follows in 5.2.2, the MET services provider shall also ensure that they have qualification adequate to perform the assigned duties.	
5.3 Qualifications 5.3.1 MET service provider shall ensure that each person assigned duties as aeronautical meteorological personnel is competent and holds appropriate qualifications to perform the duties which they are assigned. 5.3.2 MET service provider shall ensure that each person assigned duties as aeronautical meteorological personnel has been: a) appropriately trained: and b) assessed as competent through a formal process by a person who is qualified. 5.3.3 MET service provider shall develop a periodic and comprehensive recurrent training program to ensure that each person assigned duties as Aeronautical Meteorological Personnel maintains the appropriate level of qualification.	**5.3 Qualifications** 5.3.1 MET service provider shall ensure that each person assigned duties as ~~aeronautical meteorological personnel~~ AMP is competent and holds appropriate qualifications to perform the duties which they are assigned. 5.3.2 AMF shall be a person who successful completion of a university degree in meteorology or a successful completion in Basic Instruction Package for Meteorologists (BIP-M) or equivalent (after acquiring a university degree that includes the foundation topics in mathematics and physics; such topics are typically covered in science, applied science, engineering or computational courses). 5.3.3 AMOB shall be a person who successful completion in Basic Instruction Package for Meteorological Technician (BIP-MT) or equivalent. 5.3.4 MET service provider shall ensure that each person assigned duties as ~~aeronautical meteorological personnel~~ AMP has been: a) appropriately trained: and b) assessed as competent through a formal process by a person who is qualified.	- ข้อ 5.3.3 เดิม ตัดออกปรับข้อความไปอยู่ภายใต้ Chapter 6, 6.1.5 - ข้อ 5.3.2 ใหม่ เพิ่มคุณสมบัติของ AMF ย้ายจาก Chapter 5, 5.2.1 a) และ 6, 6.2.1 - ข้อ 5.3.3 ใหม่ เพิ่มคุณสมบัติของ AMOB ย้ายจาก Chapter 5, 5.2.1 b) และ 6, 6.3.1

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	5.3.5 MET service provider shall ensure that each person assigned duties as MIT has been appropriately trained in accordance with MET service provider's requirements. ~~5.3.3 MET service provider shall develop a periodic and comprehensive recurrent training program to ensure that each person assigned duties as Aeronautical Meteorological Personnel maintains the appropriate level of qualification.~~	
Chapter 6 Training ~~and checking~~ program		
6.1 General 6.1.1 This Chapter sets out the standards for a Training and Checking program. 6.1.2 MET service provider shall develop an overall training policy and program and detailed job descriptions for its Aeronautical Meteorological Personnel. The training policy and program shall lay down the training courses that different levels of Aeronautical Meteorological Personnel have to undergo to perform their duties, including initial, on-the-job training (OJT), recurrent and specialized training. 6.1.3 The job description shall depict the job purpose, key responsibilities, and outcome to be achieved of each Aeronautical Meteorological Personnel. Initial and periodic assessments shall be established that require personnel to demonstrate the required competencies. 6.1.4 MET service provider shall ensure that its Aeronautical Meteorological Personnel undergo a suitable period of supervised on-the-job training (OJT) before being deployed for duties. 6.1.5 MET service provider shall maintain individual training records including certificate for each of its Aeronautical Meteorological Personnel.	**6.1 General** 6.1.1 This Chapter sets out the standards for a Training ~~and Checking~~ program. 6.1.2 The MET service provider shall provide appropriate training and competence assessment for the Aeronautical meteorological Personnel (AMP) to perform their duties for providing Aeronautical meteorological services. 6.1.3 MET service provider shall maintain individual training records for each AMP and MIT, including certificates or approval documents related to training and competency ~~for each of its Aeronautical Meteorological Personnel~~. **6.2 Training Program** 6.2.1 The MET service provider shall establish the formal training program detailing the type of training to be provided for AMP. The training program shall contain at least the following information, a) initial training; b) on-the-job (OJT) training; c) recurrent training; d) specialized training.	- 6.1.3 ย้ายไป Chapter 4 - เพิ่ม 6.1.5 เรื่อง Recurrent Training โดยปรับจากข้อ 5.3.3

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6.1.6 MET service provider shall conduct a yearly review of the training plan for each Aeronautical Meteorological Personnel at the beginning of the year to identify any gaps in competency changes in training requirement and prioritise the type of training required for the coming year.	6.2.2 MET service provider shall establish the formal training program to be provided for MIT. 6.2.3 MET service provider shall develop the annual training plan for each AMP and MIT. ~~6.1.2 MET service provider shall develop an overall training policy and program and detailed job descriptions for its Aeronautical Meteorological Personnel. The training policy and program shall lay down the training courses that different levels of Aeronautical Meteorological Personnel have to undergo to perform their duties, including initial, on-the-job training (OJT), recurrent and specialized training.~~ ~~6.1.3 The job description shall depict the job purpose, key responsibilities, and outcome to be achieved of each Aeronautical Meteorological Personnel. Initial and periodic assessments shall be established that require personnel to demonstrate the required competencies.~~ 6.2.4 MET service provider shall ensure that its ~~Aeronautical Meteorological Personnel~~ AMP undergo a suitable period of supervised on-the-job training (OJT) before being deployed for duties. 6.2.5 MET service provider shall undergo recurrent training program to ensure that each person assigned duties as AMP keep their knowledge and skills up to date. ~~6.1.6 MET service provider shall conduct a yearly review of the training plan for each Aeronautical Meteorological Personnel at the beginning of the year to identify any gaps in competency changes in training requirement and prioritise the type of training required for the coming year.~~	
6.2 Training Requirements for Aeronautical Meteorological Forecaster (AMF)	**6.2~~3~~ Training Requirements for Aeronautical Meteorological Forecaster (AMF)**	- 6.2.1 ย้ายไป Chapter 5 ภายใต้ 5.3

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Note. — The education and training of aeronautical meteorological personnel in accordance with the Guide to the Implementation of Education and Training Standards in Meteorology and Hydrology (WMO-No. 1083) Volume I - Meteorology. 6.2.1 AMF shall be a person who successful completion of a university degree in meteorology or a successful completion in Basic Instruction Package for Meteorologists (BIP-M) or equivalent (after acquiring a university degree that includes the foundation topics in mathematics and physics; such topics are typically covered in science, applied science, engineering or computational courses). 6.2.2 AMF shall also be trained in the Aeronautical Meteorology specialization either through courses at WMO-certified training institutions along with BIP-M or less formally during attachments to aeronautical meteorological office. AMF should be familiar with: a) Phenomena that may impact on flight operations (aircraft icing, turbulence, volcanic ash, etc.); b) Procedures for meteorological services for international air navigation, as in MET MOS and MET part of Air Traffic Service Manual; c) WMO/ICAO regulatory roles and documentation. 6.2.3 AMF shall undergo on-the-job training for a period of at least 3 months as an aeronautical meteorological forecaster. The on-the-job experience shall encompass situations where the trainee will be exposed to both hazardous and non-hazardous weather conditions. 6.2.4 For an experienced meteorological forecaster from an alternative meteorological specialization, the on-the-job experience can be shortened to a period not more than 3 months. **6.3 Training Requirements for Aeronautical Meteorological Technician /Aeronautical Meteorological Observer** *Note. — The education and training of aeronautical meteorological personnel in accordance with the Guide to the Implementation of*	*Note. — The education and training of aeronautical meteorological personnel in accordance with the Guide to the Implementation of Education and Training Standards in Meteorology and Hydrology (WMO-No. 1083) Volume I - Meteorology.* ~~6.2.1 AMF shall be a person who successful completion of a university degree in meteorology or a successful completion in Basic Instruction Package for Meteorologists (BIP-M) or equivalent (after acquiring a university degree that includes the foundation topics in mathematics and physics; such topics are typically covered in science, applied science, engineering or computational courses).~~ 6.3.1 AMF shall also be trained in the Aeronautical Meteorology specialization either through courses at WMO-certified training institutions along with BIP-M or less formally during attachments to aeronautical meteorological office. AMF should be familiar with: a) Phenomena that may impact on flight operations (aircraft icing, turbulence, volcanic ash, etc.); b) Procedures for meteorological services for international air navigation, as in MET MOS and MET part of Air Traffic Service Manual; c) WMO/ICAO regulatory roles and documentation. 6.3.2 MET Service provider shall determine the duration of On-the-Job Training (OJT) for AMF as follows; a) For an inexperienced AMF, shall undergo ~~on-the-job training~~ OJT for a period of at least 3 months as an aeronautical meteorological forecaster. ~~The on-the-job experience shall encompass situations where the trainee will be exposed to both hazardous and non-hazardous weather conditions.~~ b) For an experienced AMF, OJT can be shortened to less than 3 months.	- 6.2.2 (6.2.3 เดิม) แก้ไขเพิ่มความชัดเจนสำหรับผู้ที่ไม่มีประสบการณ์การพยากรณ์อากาศการบิน และปรับระยะเวลาในการฝึกปฏิบัติงานจริง - เพิ่ม 6.2.3 ใหม่ สำหรับผู้มีประสบการณ์การพยากรณ์อากาศการบิน - 6.2.4 แก้ไขเพิ่มความชัดเจนสำหรับผู้ที่มีประสบการณ์การพยากรณ์อากาศที่ไม่ใช่ด้านการบิน และปรับระยะเวลาในการฝึกปฏิบัติงานจริง - 6.3.1 ย้ายไป Chapter 5 ภายใต้ 5.3 - 6.3.2 (6.3.3 เดิม) แก้ไขเพิ่มความชัดเจนสำหรับผู้ที่ไม่มีประสบการณ์การตรวจอากาศการบิน และปรับระยะเวลาในการฝึกปฏิบัติงานจริง - เพิ่ม 6.3.3 ใหม่ สำหรับผู้มีประสบการณ์การตรวจอากาศการบิน - 6.2.4 แก้ไขเพิ่มความชัดเจนสำหรับผู้ที่มีประสบการณ์การตรวจอากาศที่ไม่ใช่ด้านการบิน และปรับระยะเวลาในการฝึกปฏิบัติงานจริง

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Education and Training Standards in Meteorology and Hydrology (WMO-No. 1083) Volume I - Meteorology. 6.3.1 Aeronautical Meteorological Technician (AMT)/Aeronautical Meteorological Observer (AMOB) shall be a person who successful completion in Basic Instruction Package for Meteorological Technician (BIP-MT) or equivalent. 6.3.2 AMOB shall also be trained in the Aeronautical Meteorology for technicians elective option which covers the following topics; a) Basic Meteorology including phenomena that may impact on flight operations; b) observation and relevant WMO/ICAO codes; c) procedures for meteorological services for international air navigation; d) Instrumentation and/or any other appropriate topics as decided by MET service provider. 6.3.3 AMOB shall undergo at least 3 months of on-the-job training as an aeronautical meteorological observer. The on-the-job experience shall encompass situations where the trainee will be exposed to both hazardous and non-hazardous weather conditions. 6.3.4 For an experienced Observer from an alternative meteorological specialization, the on-the-job experience can be shortened to a period not more than 3 months.	For an experienced meteorological forecaster other than aeronautical meteorological field, OJT can be shortened to less than 3 months, but its duration shall exceed that required for AMF follows 6.3.2 b). ~~from an alternative meteorological specialization, the on-the-job experience can be shortened to a period not more than 3 months~~. **6.34 Training Requirements for ~~Aeronautical Meteorological Technician (AMT)~~/Aeronautical Meteorological Observer (AMOB)** *Note. — The education and training of aeronautical meteorological personnel in accordance with the Guide to the Implementation of Education and Training Standards in Meteorology and Hydrology (WMO-No. 1083) Volume I - Meteorology.* ~~6.3.1 Aeronautical Meteorological Technician (AMT)/Aeronautical Meteorological Observer (AMOB) shall be a person who successful completion in Basic Instruction Package for Meteorological Technician (BIP-MT) or equivalent.~~ 6.4.1 AMOB shall also be trained in the Aeronautical Meteorology for ~~t~~Technician~~s~~ elective option which covers the following topics; a) Basic Meteorology including phenomena that may impact on flight operations; b) observation and relevant WMO/ICAO codes; c) procedures for meteorological services for international air navigation; d) Instrumentation and/or any other appropriate topics as decided by MET service provider. 6.4.2 MET Service provider shall determine the duration of On-the-Job Training (OJT) for AMOB as follows; a) For an inexperienced AMOB, shall undergo ~~on-the-job training~~ OJT for a period of at least 3 months as an aeronautical meteorological observer. ~~The on-the-job experience shall encompass situations where the trainee will~~	

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	~~be exposed to both hazardous and non-hazardous weather conditions.~~ b) For an experienced AMOB, OJT can be shortened to less than 3 months. c) For an experienced meteorological observer other than aeronautical meteorological field, OJT can be shortened to less than 3 months, but its duration shall exceed that required for AMOB follows 6.4.2 b). ~~from an alternative meteorological specialization, the on-the-job experience can be shortened to a period not more than 3 months. AMOB shall undergo at least 3 months of on-the-job training as an aeronautical meteorological observer. The on-the-job experience shall encompass situations where the trainee will be exposed to both hazardous and non-hazardous weather conditions.~~ ~~6.3.4 For an experienced from an alternative meteorological specialization, the on-the-job experience can be shortened to a period not more than 3 months.~~	
6.4 Requirement for Assessors 6.4.1 Competency shall be demonstrated through job performance and assessed through competency assessment procedures, as appropriate. *Note. — Guidance on competency development and assessment procedures is provided in Guide for the Development and Implementation of Competency based Frameworks in Support of Meteorological, Hydrological and Climatological Services (in preparation) (WMO-No. 1205).* 6.4.2 MET service provider shall: a) appoint Assessors to conduct the competency assessment for its Aeronautical Meteorological Personnel;	**6.~~4~~5 Requirement for Assessors** 6.~~4~~5.1 Competency shall be demonstrated through job performance and assessed through competency assessment procedures, as appropriate. *Note. — Guidance on competency development and assessment procedures is provided in Guide for the Development and Implementation of Competency based Frameworks in Support of Meteorological, Hydrological and Climatological Services (in preparation) (WMO-No. 1205).* 6.~~4~~5.2 MET service provider shall: a) appoint Assessors to conduct the competency assessment for its Aeronautical Meteorological Personnel; b) ensure that the Assessors are not the direct Supervisor of the Aeronautical Meteorological Personnel under assessment in order to prevent conflict of interest;	แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบท รวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้

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b) ensure that the Assessors are not the direct Supervisor of the Aeronautical Meteorological Personnel under assessment in order to prevent conflict of interest; c) ensure that the Assessors are adequately trained to conduct the assessment; d) ensure that the Assessors of the Aeronautical Meteorological Forecaster (AMF) possess a meteorological qualification which satisfies the WMO's Basic Instruction Package for Meteorologists (BIP-M) and have at least five years of operational experience as an AMF; and e) ensure that the Assessors for the Aeronautical Meteorological Observer (AMOB) and Aeronautical Meteorological Technician (AMT) possess a meteorological qualification which satisfies the WMO's Basic Instruction Package for Meteorological Technician (BIP-MT) and have at least five years of operational experience as an AMOB.	c) ensure that the Assessors are adequately trained to conduct the assessment; d) ensure that the Assessors of the Aeronautical Meteorological Forecaster (AMF) possess a meteorological qualification which satisfies the WMO's Basic Instruction Package for Meteorologists (BIP-M) and have at least five years of operational experience as an AMF; and e) ensure that the Assessors for the Aeronautical Meteorological Observer (AMOB) ~~and Aeronautical Meteorological Technician (AMT)~~ possess a meteorological qualification which satisfies the WMO's Basic Instruction Package for Meteorological Technician (BIP-MT) and have at least five years of operational experience as an AMOB.	
6.5 Conduct of Assessment 6.5.1 MET service provider shall: a) assess the competency of its Aeronautical Meteorological Personnel. b) establish competency assessment programmes for different categories of operational personnel, competency assessments shall be repeated at regular intervals defined by the quality management practice of each MET service provider. c) ensure that the competency assessment is in accordance to the guidelines developed and endorsed by the WMO Commission for Aeronautical Meteorology (CAeM). ensure that all Aeronautical Meteorological Personnel satisfy the competency standards.	**6.5~~5~~6 Conduct of Assessment** 6.5~~5~~6.1 MET service provider shall: a) assess the competency of its Aeronautical Meteorological Personnel. b) be carried out in actual operational duty, except in cases where it is not feasible due to exceptional circumstances, such as natural disasters or pandemics. c) establish competency assessment programmes for different categories of operational personnel, competency assessments shall be repeated at regular intervals defined by the quality management practice of each MET service provider. d) ensure that the competency assessment is in accordance to the guidelines developed ~~and endorsed~~ by the WMO ~~Commission for Aeronautical Meteorology (CAeM).~~ e) ensure that all Aeronautical Meteorological Personnel satisfy the competency standards.	แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบท รวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้

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	6.6.2 The competency assessment team shall consist of at least three members.	
Chapter 7 Meteorological facilities and equipment		
7.1 General 7.1.1 This Chapter sets out the standards for meteorological facilities and equipment. 7.1.2 MET facilities and equipment shall: a) be tested for normal operations on a routine basis; b) meet the required level of accuracy, reliability and availability through a combination of routine calibrations, testing and/or regular parts replacement, and timely resolution of system failures; c) provide for the timely and appropriate detection and warning of system failures and degradations; d) include documentation on the consequences of system, sub-system and equipment failures and degradations; and e) include measures to control the probability of failures and degradations. 7.1.3 MET service provider shall establish maintenance plan for each equipment. The plan shall include: a) procedure for the periodic maintenance of each equipment; b) calibration displays related to integrated automatic systems that provide to air traffic services units; and c) The spare support plan for each facility. 7.1.4 MET service provider shall establish procedures to ensure that: a) each of the meteorological offices and facilities is provided with suitable power supplies and means to ensure appropriate continuity of service; and b) each of the remote weather sensing facilities is installed and maintained in a technically appropriate position to ensure	**7.1 General** 7.1.1 This Chapter sets out the standards for meteorological facilities and equipment. 7.1.2 MET facilities and equipment shall: a) be tested for normal operations on a routine basis; b) meet the required level of accuracy, reliability and availability through a combination of routine calibrations, ~~testing~~ and/or regular parts replacement, and timely resolution of system failures; c) ~~provide for the timely and appropriate detection and warning of system failures and degradations~~; d) include documentation on the consequences of system, sub-system and equipment failures and degradations; and e) ~~include measures to control the probability of failures and degradations~~. 7.1.3 MET service provider shall ~~establish~~ arrange maintenance ~~plan~~ for each equipment~~. The plan shall~~ including~~e~~: a) procedure for the ~~periodic~~ maintenance of each equipment; a) ~~calibration displays related to integrated automatic systems that provide to air traffic services units~~; and b) ~~T~~the spare support plan for each facility. 7.1.4 MET service provider shall ~~establish procedures to~~ ensure that each of the meteorological offices and facilities is provided with suitable power supplies and means to ensure appropriate continuity of service~~; and~~. 7.1.5 MET service provider shall establish procedures to ensure that each of the remote sensing facilities is installed and maintained in a technically appropriate position to ~~ensure that the facility~~	- ปรับข้อภายใต้ 7.2 AWOS ขึ้นมาเป็น General

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that the facility provides an accurate representation of the local meteorological conditions.	provides an accurate representation of the local meteorological conditions.	
7.1.5 MET service provider shall arrange for its aeronautical meteorological stations to be inspected at sufficiently frequent intervals to ensure that a high standard of observation is maintained, that instruments and all their indicators are functioning correctly, and that the exposure of the instruments has not changed significantly.	7.1.56 MET service provider shall arrange for its aeronautical meteorological stations to be inspected at sufficiently frequent intervals to ensure that a high standard of observation is maintained, that instruments and all their indicators are functioning correctly, and that the exposure of the instruments has not changed significantly.	
Note. — Guidance on the inspection of aeronautical meteorological stations including the frequency of inspections is given in the Manual on Automatic Meteorological Observing Systems at Aerodromes (Doc 9837).	*Note. — Guidance on the inspection of aeronautical meteorological stations including the frequency of inspections is given in the Manual on Automatic Meteorological Observing Systems at Aerodromes (Doc 9837).*	
7.1.6 At aerodromes which can be used for Category II and III instrument approach and landing operations, automated equipment for measuring or assessing, as appropriate, and for monitoring and remote indicating of surface wind, visibility, runway visual range, height of cloud base, air and dew-point temperatures and atmospheric pressure shall be installed to support approach and landing and take-off operations. These devices shall be integrated automatic systems for acquisition, processing, dissemination and display in real time of the meteorological parameters affecting landing and take-off operations. The design of integrated automatic systems shall observe Human Factors principles and include back-up procedure.	7.1.67 At aerodromes which can be used for Category II and III instrument approach and landing operations, automated equipment for measuring or assessing, as appropriate, and for monitoring and remote indicating of surface wind, visibility, runway visual range, height of cloud base, air and dew-point temperatures and atmospheric pressure shall be installed to support approach and landing and take-off operations. These devices shall be integrated automatic systems for acquisition, processing, dissemination and display in real time of the meteorological parameters affecting landing and take-off operations. The design of integrated automatic systems shall observe Human Factors principles and include back-up procedure.	
Note 1.— Categories of precision approach and landing operations are defined in ICAO Annex 6, Part I.	*Note 1.— Categories of precision approach and landing operations are defined in ICAO Annex 6, Part I.*	
Note 2.— Guidance material on the application of Human Factors principles can be found in the Human Factors Training Manual (Doc 9683).	*Note 2.— Guidance material on the application of Human Factors principles can be found in the Human Factors Training Manual (Doc 9683).*	
7.1.7 At aerodromes with runways intended for Category I instrument approach and landing operations, automated equipment for measuring or assessing, as appropriate, and for monitoring and remote indicating of surface wind, visibility, runway visual range, height of cloud base, air and dew-point temperatures and atmospheric pressure should be installed to	7.1.78 At aerodromes with runways intended for Category I instrument approach and landing operations, automated equipment for measuring or assessing, as appropriate, and for monitoring and remote indicating of surface wind, visibility, runway visual range, height of cloud base, air and dew-point temperatures and	

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support approach and landing and take-off operations. These devices shall be integrated automatic systems for acquisition, processing, dissemination and display in real time of the meteorological parameters affecting landing and take-off operations. The design of integrated automatic systems should observe Human Factors principles and include back-up procedures.	atmospheric pressure should be installed to support approach and landing and take-off operations. These devices shall be integrated automatic systems for acquisition, processing, dissemination and display in real time of the meteorological parameters affecting landing and take-off operations. The design of integrated automatic systems should observe Human Factors principles and include back-up procedures.	
7.2 Automated Weather Observing System (AWOS) *Note. — The installation of Automated weather observing System in accordance with ICAO Annex 3 Appendix 3, ICAO DOC 8896, 9328, 9837 and 9157 Part 6.* 7.2.1 Where an integrated semi-automatic system is used for the dissemination/display of meteorological information, it should be capable of accepting the manual insertion of data covering those meteorological elements which cannot be observed by automatic means 7.2.2 The meteorological instruments used at an aerodrome should be situated in such a way as to supply data which are representative of the area for which the measurements are required ICAO Annex 3, Appendix 3, 1.1. *Note. — Specifications concerning the siting of equipment and installations on operational areas, aimed at reducing the hazard to aircraft to a minimum, are contained in ICAO Annex 14, Volume I, Chapter 9.* 7.2.3 Meteorological instruments at aeronautical meteorological stations should be exposed, operated and maintained in accordance with the practices, procedures and specifications promulgated by the World Meteorological Organization (WMO).	**7.2 Automated Weather Observing System (AWOS)** *Note. — The installation of Automated weather observing System in accordance with ICAO Annex 3 Appendix 3, ICAO DOC 8896, 9328, 9837 and 9157 Part 6.* 7.2.1 Where an integrated semi-automatic system is used for the dissemination/display of meteorological information, it should be capable of accepting the manual insertion of data covering those meteorological elements which cannot be observed by automatic means 7.2.2 The meteorological instruments used at an aerodrome should be situated in such a way as to supply data which are representative of the area for which the measurements are required ICAO Annex 3, Appendix 3, 1.1. *Note. — Specifications concerning the siting of equipment and installations on operational areas, aimed at reducing the hazard to aircraft to a minimum, are contained in ICAO Annex 14, Volume I, Chapter 9.* 7.2.3 Meteorological instruments at aeronautical meteorological stations should be exposed, operated and maintained in accordance with the practices, procedures and specifications promulgated by the World Meteorological Organization (WMO). *Note.— Practices, procedures and specifications of WMO are contained in the Guide to Instruments and Methods of Observation (WMO-No. 8), Volume I— Measurement of Meteorological Variables, Volume II—*	- เพิ่ม Note ใน 7.2.3

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	Observing Systems; and Volume III— Quality Assurance and Management of Observing Systems.	
	7.3 Meteorological observation instruments other than AWOS 7.3.1 MET service provider shall ensure that meteorological observation instruments other than AWOS a) be located at appropriate siting in accordance with 7.2.5 – 7.2.9; and b) the displays in the meteorological station and in the air traffic services units shall relate to the same sensors.	-แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบท รวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้
7.3 LLWAS **...**	**7.34 LLWAS** **...**	
Chapter 8 Management System		
8.2 Quality Management System 8.2.1 MET service provider shall establish and implement a properly organized quality system comprising procedures, processes and resources necessary to provide for the quality management of the meteorological information to be supplied to the aviation users. 8.2.2 The quality system established in accordance with 8.2.1 should be in conformity with the International Organization for Standardisation (ISO) 9000 series of quality assurance standards and should be certified by an approved organization. *Note.— The ISO 9000 series of quality assurance standards provide a basic framework for the development of a quality assurance programme. The details of a successful programme are to be formulated by each State and in most cases are unique to the State organization. Guidance on the establishment and implementation of quality management system is given in the Guide to the Implementation of Quality Management Systems for National Meteorological and Hydrological Services and Other Relevant Service Providers (WMO-No. 1100).*	**8.2 Quality Management System** 8.2.1 MET service provider shall establish and implement a properly organized quality system comprising procedures, processes and resources necessary to provide for the quality management of the meteorological information to be supplied to the aviation users. 8.2.2 MET service provider should identify the key personnel responsible for the quality management to conduct of the MET services. 8.2.3 The quality system established in accordance with 8.2.1 should be in conformity with the International Organization for Standardisation (ISO) 9000 series of quality assurance standards and should be certified by an approved organization. *Note.— The ISO 9000 series of quality assurance standards provide a basic framework for the development of a quality assurance programme. The details of a successful programme are to be formulated by each State and in most cases are unique to the State organization. Guidance on the establishment and implementation of quality management system is given in the*	- 8.2.2 ย้ายจาก 4.1.3

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8.2.3 The quality system should provide the users with assurance that the meteorological information supplied complies with the CAAT requirements in terms of the geographical and spatial coverage, format and content, time and frequency of issuance and period of validity, as well as the accuracy of measurements, observations and forecasts. When the quality system indicates that meteorological information to be supplied to the users does not comply with the stated requirements, and automatic error correction procedures are not appropriate, such information should not be supplied to the users unless it is validated with the originator. *Note.— Requirements concerning the geographical and spatial coverage, format and content, time and frequency of issuance and period of validity of meteorological information to be supplied to aeronautical users are given in Chapters 12, 13, 14, 15, 16 and 17 of this MET MOS and ICAO Annex 3, Appendices 2, 3, 5, 6, 7, 8 and 9 and Asia/Pacific regional air navigation plan. Guidance concerning the accuracy of measurement and observation, and accuracy of forecasts is given in ICAO Annex 3, Attachments A and B, respectively.* 8.2.4 In regard to the exchange of meteorological information for operational purposes, the quality system should include verification and validation procedures and resources for monitoring adherence to the prescribed transmission schedules for individual messages and/or bulletins required to be exchanged, and the times of their filing for transmission. The quality system should be capable of detecting excessive transit times of messages and bulletins received. *Note.— Requirements concerning the exchange of operational meteorological information are given in Chapter 16 and ICAO Annex 3, Appendix 10.*	*Guide to the Implementation of Quality Management Systems for National Meteorological and Hydrological Services and Other Relevant Service Providers (WMO-No. 1100).* 8.2.4 The quality system should provide the users with assurance that the meteorological information supplied complies with the CAAT requirements in terms of the geographical and spatial coverage, format and content, time and frequency of issuance and period of validity, as well as the accuracy of measurements, observations and forecasts. When the quality system indicates that meteorological information to be supplied to the users does not comply with the stated requirements, and automatic error correction procedures are not appropriate, such information should not be supplied to the users unless it is validated with the originator. *Note.— Requirements concerning the geographical and spatial coverage, format and content, time and frequency of issuance and period of validity of meteorological information to be supplied to aeronautical users are given in Chapters 12, 13, 14, 15, 16 and 17 of this MET MOS, ~~and ICAO Annex 3,~~ PANS-MET (Doc 10157), Chapter 2, 4, 5, 6, 7, 8 and 9 ~~Appendices 2, 3, 5, 6, 7, 8 and 9~~ and Asia/Pacific regional air navigation plan. Guidance concerning the accuracy of measurement and observation, and accuracy of forecasts is ~~given~~ contained in the PANS-MET ~~ICAO Annex 3,~~ Attachments A and B, respectively.* 8.2.5 In regard to the exchange of meteorological information for operational purposes, the quality system should include verification and validation procedures and resources for monitoring adherence to the prescribed transmission schedules for individual messages and/or bulletins required to be exchanged, and the times of their filing for transmission. The quality system should be capable of detecting excessive transit times of messages and bulletins received.	

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8.2.5 Demonstration of compliance of the quality system applied shall be by audit. If nonconformity of the system is identified, action shall be initiated to determine and correct the cause. All audit observations shall be evidenced and properly documented.	*Note.— Requirements concerning the exchange of operational meteorological information are given in Chapter 16, ~~and ICAO Annex 3,~~ PANS-MET (Doc 10157), Chapter 10 ~~Appendix 10~~.* 8.2.6 Demonstration of compliance of the quality system applied shall be by audit. If nonconformity of the system is identified, action shall be initiated to determine and correct the cause. All audit observations shall be evidenced and properly documented.	
Chapter 9 Contingency Plan		
9.1 General 9.1.1 This Chapter sets out the standards for contingency plans. 9.1.2 MET service provider shall establish a contingency plan that sets out the procedures to be followed if aeronautical meteorological services are interrupted. 9.1.3 A contingency plan shall describe in detail the actions that operational staffs are to follow to maintain aeronautical meteorological services in the event of the meteorological services system failure or non-availability of staffs, facilities or equipment which affects the provision of aeronautical meteorological services. The plan shall also cover procedures for the safe and orderly transition back to full service provision. 9.1.4 The contingency plan shall include: a) the actions to be taken by personnel responsible for providing the service; b) possible alternative arrangements for providing the service; and c) arrangements for resuming normal provision of the service.	**9.1 General** 9.1.1 This Chapter sets out the standards for contingency plans. 9.1.2 MET service provider shall establish a contingency plan that sets out the procedures to be followed if aeronautical meteorological services are interrupted. 9.1.3 A contingency plan shall describe in detail the actions that operational staffs are to follow to maintain aeronautical meteorological services in the event of the meteorological services system failure or non-availability of staffs, facilities or equipment which affects the provision of aeronautical meteorological services. The plan shall also cover procedures for the safe and orderly transition back to full service provision. 9.1.4 The contingency plan shall include: a) the actions to be taken by personnel responsible for providing the service; b) possible alternative arrangements for providing the service; and c) arrangements for resuming normal provision of the service. 9.1.5 MET service provider shall conduct regular drill of its the contingency plan to ensure operational resilience.	- เพิ่มเรื่องการฝึกซ้อมแผนฉุกเฉิน

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Chapter 11 Documents and Records		
11.2 Documents and Records to be maintained 11.2.1 MET service provider shall maintain documents and records of operation and maintenance of the service for both safety oversight and quality management purposes. These documents and records shall include but not limited to: a) Copies of the Air Navigation Act and related regulations and requirements; b) Copies of Annex 3, and Annex 15; c) Copies of ICAO Doc. 8896, 9328, 9377, 9817 and 9837; d) a copy of the parts of the AIP that are relevant to any Aeronautical Meteorological Services that it provides; e) the Manual of Standards - Aeronautical Meteorological Services (MET MOS); f) all manuals and documents indicated in the Manual of Standards - Aeronautical Meteorological Services (MET MOS); g) a copy of any instruction issued to its personnel in relation to the provision of its Aeronautical Meteorological Services; h) manuals for equipment used by staff in the provision of Aeronautical Meteorological Services; i) other necessary documents concerned; j) reports of queries on weather information for incidents/accidents; k) records of internal quality audit reports; l) archive of low level wind shear alert system and automated weather observing system; and record of job description, training programme and training plan of each year.	**11.2 Documents and Records to be maintained** 11.2.1 MET service provider shall maintain documents and records of operation and maintenance of the service for both safety oversight and quality management purposes. These documents and records shall include but not limited to: a) Copies of the Air Navigation Act and related regulations and requirements; b) Copies of Annex 3, and Annex 15; c) Copies of ICAO Doc. 8896, 9328, 9377, 9817 ~~and~~ 9837 and 10157; d) a copy of the parts of the AIP that are relevant to any Aeronautical Meteorological Services that it provides; e) the Manual of Standards - Aeronautical Meteorological Services (MET MOS); f) all manuals and documents indicated in the Manual of Standards - Aeronautical Meteorological Services (MET MOS); g) a copy of any instruction issued to its personnel in relation to the provision of its Aeronautical Meteorological Services; h) manuals for equipment used by staff in the provision of Aeronautical Meteorological Services; i) other necessary documents concerned; j) reports of queries on weather information for incidents/accidents; k) records of internal quality audit reports; l) archive of low level wind shear alert system and automated weather observing system; and record of job description, training programme and training plan of each year.	- เพิ่ม PANS-MET, DOC 10157

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11.4 Retention period 11.4.1 MET service provider shall retain meteorological data and information: a) retain meteorological information supplied to flight crew members either as printed copies or in computer files, for a period of at least 30 days from the date of issue; and b) the meteorological information supplied to flight crew members shall be made available, on request, for inquiries or investigations and, for these purposes, shall be retained until the inquiry or investigation is completed. 11.4.2 MET service provider shall retain all records exclude subsection 11.4.1, at least five years.	11.4 Retention period 11.4.1 MET service provider shall retain flight documentation ~~meteorological data and information~~: a) ~~retain meteorological information~~ supplied to flight crew members either as printed copies or in computer files, for a period of at least 30 days from the date of issue; and b) ~~the meteorological information~~ supplied to flight crew members shall be made available, on request, for inquiries or investigations and, for these purposes, shall be retained until the inquiry or investigation is completed. 11.4.2 MET service provider shall retain all records, and meteorological information ~~exclude subsection 11.4.1,~~ at least five years.	
Chapter 12 The use of meteorological information from Global Systems, Supporting Centres and OPMET Data Exchange Centres		
12.1 General 12.1.1 This Chapter sets out the standards for the use of meteorological information from Global Systems, Supporting Centres and OPMET Data Exchange Centres 12.1.2 Technical specifications and detailed criteria related to Global Systems and Supporting Centres are contained in ICAO Annex 3, Appendix 2. 12.1.3 Technical specifications and detailed criteria related to OPMET Data Exchange Centres are contained in ROBEX HANDBOOK.	**12.1 General** 12.1.1 This Chapter sets out the standards for the use of meteorological information from Global Systems, Supporting Centres and OPMET Data Exchange Centres 12.1.2 ~~Technical specifications and detailed criteria~~ *The Standards and Recommended Practices* related to Global Systems and Supporting Centres are contained in ~~ICAO Annex 3, Appendix 2~~ PANS-MET (Doc 10157), Chapter 3 and Appendix 5. 12.1.3 Technical specifications and detailed criteria related to OPMET Data Exchange Centres are contained in ROBEX HANDBOOK.	- 12.1.2 ให้ลิงก์ไปที่ PANS-MET
12.2 World area forecast centres (WAFCs) 12.2.1 The objective of the world area forecast system shall be to supply MET service provider and other users with global aeronautical meteorological en-route forecasts in digital form. This objective shall be achieved through a comprehensive, integrated, worldwide	**12.2 World area forecast centres (WAFCs) within the framework of the world area forecast system** 12.2.1 The objective of the world area forecast system (WAFS) is ~~shall be~~ to supply MET service provider and other users with global aeronautical meteorological en-route forecasts in digital form. This	- 12.2.1 ปรับข้อความตาม Annex 3

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and, as far as practicable, uniform system, and in a cost-effective manner, taking full advantage of evolving technologies. 12.2.2 MET service provider shall have to be familiar with the roles/functions of WAFCs so as to be able to interact with them and use their products/services effectively.	objective is ~~shall be~~ achieved through a comprehensive, integrated, worldwide and, as far as practicable, uniform system, and in a cost-effective manner, taking full advantage of evolving technologies. 12.2.2 MET service provider shall have to be familiar with the roles/functions of WAFCs so as to be able to interact with them and use their products/services effectively.	
Chapter 13 Standards for Aeronautical Meteorological Stations		
13.1 General 13.1.1 This Chapter sets out the standards for aeronautical meteorological stations. 13.1.2 MET service provider shall provide observations and reports in accordance with Technical specifications in ICAO Annex 3, Appendix 3. 13.1.3 MET service provider shall establish aeronautical meteorological stations at aerodromes. An aeronautical meteorological station may be a separate station or may be combined with a synoptic station. *Note. — Aeronautical meteorological stations may include sensors installed outside the aerodrome, where considered justified, by MET service provider to ensure the compliance of meteorological service for air navigation with the provisions of this MET MOS.* 13.1.4 MET service provider should establish, or arrange for the establishment of, aeronautical meteorological stations on offshore structures or at other points of significance in support of helicopter operations to offshore structures, if required by Asia/Pacific air navigation agreement. 13.1.5 The observations shall form the basis for the preparation of reports to be disseminated at the aerodrome of origin and of reports to be disseminated beyond the aerodrome of origin.	**13.1 General** 13.1.1 This Chapter sets out the standards for aeronautical meteorological stations. 13.1.2 MET service provider shall provide observations and reports in accordance with ~~Technical specifications~~ *the Standards and Recommended Practices* in ~~ICAO Annex 3, Appendix 3~~PANS-MET (Doc 10157), Chapter 2, and Appendix 2. 13.1.3 MET service provider shall establish aeronautical meteorological stations at aerodromes. An aeronautical meteorological station may be a separate station or may be combined with a synoptic station. *Note. — Aeronautical meteorological stations may include sensors installed outside the aerodrome, where considered justified, by MET service provider to ensure the compliance of meteorological service for air navigation with the provisions of this MET MOS.* 13.1.4 MET service provider should establish, or arrange for the establishment of, aeronautical meteorological stations on offshore structures or at other points of significance in support of helicopter operations to offshore structures, if required by Asia/Pacific air navigation agreement. 13.1.5 The observations shall form the basis for the preparation of reports to be disseminated at the aerodrome of origin and of reports to be disseminated beyond the aerodrome of origin.	- แก้ไขเอกสารที่ทำเชื่อมโยงโดยเป็น PANS-MET Chapter 2 และ Appendix 2 - เพิ่ม 13.1.6 ตาม Annex 3

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	13.1.6 The observers at an aerodrome should be located, in so far as is practicable, so as to supply data which are representative of the area for which the observations are required.	
13.2 Aeronautical meteorological station function 13.2.1 Aeronautical meteorological stations shall make routine observations at fixed intervals. At aerodromes, the routine observations shall be supplemented by special observations whenever specified changes occur in respect of surface wind, visibility, runway visual range, present weather, clouds and/or air temperature. 13.2.2 At aerodromes, routine observations shall be made throughout the 24 hours of each day, unless otherwise agreed between MET service provider, the appropriate ATS authority and the operator concerned. Such observations shall be made at intervals of one hour or, if so, determined by Asia and Pacific Regions (APAC) Air Navigation Plan and ASIA/PAC FASID (facilities and services implementation document), at intervals of one half-hour. At other aeronautical meteorological stations, such observations shall be made as determined by MET service provider taking into account the requirements of air traffic services units and aircraft operations. 13.2.3 At aerodromes that are not operational throughout 24 hours: a) METAR should be issued at least 3 hours prior to the aerodrome resuming operations. b) SPECI shall be issued, as necessary. 13.2.4 Reports of routine observations shall be issued as: a) local routine reports, only for dissemination at the aerodrome of origin (intended for arriving and departing aircraft); and b) METAR for dissemination beyond the aerodrome of origin (mainly intended for flight planning, VOLMET broadcasts and D-VOLMET).	**13.2 Aeronautical meteorological station function** 13.2.1 Aeronautical meteorological stations shall make routine observations at fixed intervals. At aerodromes, the routine observations shall be supplemented by special observations whenever specified changes occur in respect of surface wind, visibility, runway visual range, present weather, clouds and/or air temperature. 13.2.2 At aerodromes, routine observations shall be made throughout the 24 hours of each day, unless otherwise agreed between MET service provider, the appropriate ATS authority and the operator concerned. Such observations shall be made at intervals of one hour or, if so, determined by Asia and Pacific Regions (APAC) Air Navigation Plan and ASIA/PAC FASID (facilities and services implementation document), at intervals of one half-hour. At other aeronautical meteorological stations, such observations shall be made as determined by MET service provider taking into account the requirements of air traffic services units and aircraft operations. 13.2.3 At aerodromes that are not operational throughout 24 hours: a) METAR shall ~~should~~ be issued ~~at least 3 hours~~ prior to the aerodrome resuming operations. b) SPECI shall be issued, as necessary. 13.2.4 Reports of routine observations shall be issued as: a) local routine reports, only for dissemination at the aerodrome of origin (intended for arriving and departing aircraft); and b) METAR for dissemination beyond the aerodrome of origin (mainly intended for flight planning, VOLMET broadcasts and D-VOLMET).	แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบทรวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้

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Note. — Meteorological information used in ATIS (voice-ATIS and D-ATIS) is to be extracted from the local routine report, in accordance with ICAO Annex 11, 4.3.6.1 g). 13.2.5 Reports of special observations shall be issued as: a) local special reports, only for dissemination at the aerodrome of origin (intended for arriving and departing aircraft); and b) SPECI for dissemination beyond the aerodrome of origin (mainly intended for flight planning, VOLMET broadcasts and D-VOLMET) unless METAR are issued at half-hourly intervals. *Note. — Meteorological information used in ATIS (voice-ATIS and D-ATIS) is to be extracted from the local special report, in accordance with ICAO Annex 11, 4.3.6.1 g)* 13.2.6 A list of criteria for special observations shall be established by MET service provider, in consultation with the appropriate ATS authority, operators and others concerned.	*Note. — Meteorological information used in ATIS (voice-ATIS and D-ATIS) is to be extracted from the local routine report, in accordance with ICAO Annex 11, 4.3.6.1 g).* 13.2.5 Reports of special observations shall be issued as: a) local special reports, only for dissemination at the aerodrome of origin (intended for arriving and departing aircraft); and b) SPECI for dissemination beyond the aerodrome of origin (mainly intended for flight planning, VOLMET broadcasts and D-VOLMET) unless METAR are issued at half-hourly intervals. *Note. — Meteorological information used in ATIS (voice-ATIS and D-ATIS) is to be extracted from the local special report, in accordance with ICAO Annex 11, 4.3.6.1 g)* 13.2.6 A list of criteria for special observations shall be established by MET service provider, in consultation with the appropriate ATS authority, operators and others concerned.	
13.3 Contents of reports 13.3.1 Local routine reports, local special reports, METAR and SPECI shall contain the following elements in the order indicated: a) identification of the type of report; b) location indicator; c) time of the observation; d) identification of an automated or missing report, when applicable; e) surface wind direction and speed; f) visibility; g) runway visual range, when applicable; h) present weather; i) cloud amount, cloud type (only for cumulonimbus and towering cumulus clouds) and height of cloud base or, where measured, vertical visibility;	**13.3 ~~Contents of~~ Characteristic of meteorological reports** 13.3.1 Local routine reports, local special reports, METAR and SPECI shall contain the following meteorological elements in the order indicated: ~~a) identification of the type of report;~~ ~~b) location indicator;~~ ~~c) time of the observation;~~ ~~d) identification of an automated or missing report, when applicable;~~ a) surface wind direction and speed; b) visibility; c) runway visual range, when applicable; d) present weather;	- ตัดออกตาม Annex 3

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j) air temperature and dew-point temperature; and k) QNH and, when applicable, QFE (QFE included only in local routine and special reports). *Note. — The location indicators referred to under b) and their significations are published in Location Indicators (ICAO DOC 7910).* 13.3.2 Addition to elements listed under subsection 13.3.1 a) to k), Local routine reports, local special reports, METAR and SPECI should contain supplementary information to be placed after element k).	e) cloud amount, cloud type (only for cumulonimbus and towering cumulus clouds) and height of cloud base or, where measured, vertical visibility; f) air temperature and dew-point temperature; and g) QNH and, when applicable, QFE (QFE included only in local routine report and local special reports). ~~*Note. — The location indicators referred to under b) and their significations are published in Location Indicators (ICAO DOC 7910).*~~ 13.3.2 Addition to elements listed under subsection 13.3.1 a) to ~~k~~g), Local routine reports, local special reports, METAR and SPECI should contain supplementary information ~~to be placed after element k)~~.	
13.4.2 Visibility a) the visibility as defined in subsection 1.2.1 shall be measured or observed, and reported in metres or kilometers. *Note. — Guidance on the conversion of instrument readings into visibility is contained in ICAO Annex 3, Attachment D.* b) when local routine and special reports are used for departing aircraft, the visibility observations for these reports should be representative of conditions along the runway; when local routine and special reports are used for arriving aircraft, the visibility observations for these reports should be representative of the touchdown zone of the runway. c) for METAR and SPECI, the visibility observations should be representative of the aerodrome.	**13.4.2 Visibility** a) the visibility as defined in subsection 1.2.1 shall be measured or observed, and reported in metres or kilometers. *Note. — Guidance on the conversion of instrument readings into visibility is contained in ~~ICAO Annex 3~~ PANS-MET (Doc 10157), Attachment D.* b) when local routine report and local special reports are used for departing aircraft, the visibility observations for these reports should be representative of conditions along the runway; when local routine report and local special reports are used for arriving aircraft, the visibility observations for these reports should be representative of the touchdown zone of the runway. c) for METAR and SPECI, the visibility observations should be representative of the aerodrome.	- เพิ่มเติมตาม Annex 3 Note. อยู่ใน PANS-MET
13.4.4 Present weather a) the present weather occurring at the aerodrome shall be observed and reported as necessary. The following present weather phenomena shall be identified, as a minimum: rain,	**13.4.4 Present weather** a) the present weather occurring at the aerodrome shall be observed and reported as necessary. The following present weather phenomena shall be identified, as a minimum:	- แก้ไขตาม Annex 3

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drizzle, snow and freezing precipitation (including intensity thereof), haze, mist, fog, freezing fog and thunderstorms (including thunderstorms in the vicinity). b) for local routine and special reports, the present weather information should be representative of conditions at the aerodrome. for METAR and SPECI, the present weather information should be representative of conditions at the aerodrome and, for certain specified present weather phenomena, in its vicinity.	1. precipitation: rain, drizzle, snow and freezing precipitation (including intensity thereof); 2. obscurations: haze, mist, fog, and freezing fog; and 3. thunderstorms (including thunderstorms in the vicinity). b) for local routine report and local special reports, the present weather information should be representative of conditions at the aerodrome. for METAR and SPECI, the present weather information should be representative of conditions at the aerodrome and, for certain specified present weather phenomena, in its vicinity.	
13.5 Reporting meteorological information from automatic observing systems 13.5.1 METAR and SPECI from automatic observing systems should be used at aerodrome during non-operational hours, and during operational hours of the aerodrome should be determined by MET service provider in consultation with users based on the availability and efficient use of personnel. *Note. — Guidance on the use of automatic meteorological observing systems is given in ICAO DOC 9837* 13.5.2 Local routine and special reports from automatic observing systems should be used at aerodrome, and during operational hours of the aerodrome should be determined by MET service provider in consultation with users based on the availability and efficient use of personnel. 13.5.3 Local routine reports, local special reports, METAR and SPECI from automatic observing systems shall be identified with the word “AUTO”.	**13.5 Reporting meteorological information from automatic observing systems** 13.5.1 METAR and SPECI from automatic observing systems should be used at aerodrome during non-operational hours, and during operational hours of the aerodrome should be determined by MET service provider in consultation with users based on the availability and efficient use of personnel. *Note. — Guidance on the use of automatic meteorological observing systems is ~~given~~ contained in ICAO DOC 9837* 13.5.2 Local routine report and local special reports from automatic observing systems should be used at aerodrome, and during operational hours of the aerodrome should be determined by MET service provider in consultation with users based on the availability and efficient use of personnel. 13.5.3 Local routine reports, local special reports, METAR and SPECI from automatic observing systems shall be identified with the word “AUTO”.	- แก้ไขตาม Annex 3
	13.6 Dissemination of meteorological reports **13.6.1 METAR and SPECI** 13.6.1.1 METAR and SPECI shall be disseminated to a) National OPMET center (NOC) ~~international OPMET databanks and the centres designated by Asia/Pacific air navigation agreement~~ for the operation of aeronautical	แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบท รวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้

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	fixed service Internet-based services, in accordance with Asia/Pacific air navigation agreement. b) other aerodromes in accordance with Asia/Pacific air navigation agreement. 13.6.1.2 SPECI representing a deterioration in conditions shall be disseminated immediately after the observation. A SPECI representing a deterioration of one weather element and an improvement in another element shall be disseminated immediately after the observation. 13.6.1.3 A SPECI representing an improvement in conditions should be disseminated only after the improvement has been maintained for 10 minutes; it should be amended before dissemination, if necessary, to indicate the conditions prevailing at the end of that 10-minute period. **13.6.2 Local routine report and local special report** 13.6.2.1 Local routine reports shall be transmitted to local air traffic services units and shall be made available to the operators and to other users at the aerodrome. 13.6.2.2 Local special reports shall be transmitted to local air traffic services units as soon as the specified conditions occur. However, as agreed between the MET service provider and the appropriate ATS authority, they need not be issued in respect of: a) any element for which there is in the local air traffic services unit a display corresponding to the one in the meteorological station, and where arrangements are in force for the use of this display to update information included in local routine report and local special report; and b) runway visual range, when all changes of one or more steps on the reporting scale in use are being reported to the local air traffic services unit by an observer on the aerodrome.	

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	Local special reports shall also be made available to the operators and to other users at the aerodrome.	
Chapter 14 Standards for Aerodrome Meteorological Offices		
14.1 General 14.1.1 This Chapter sets out the standards for aerodrome meteorological offices. 14.1.2 For an aerodrome without an aerodrome meteorological office located at the aerodrome: a) MET service provider shall designate one or more aerodrome meteorological office(s) to supply meteorological information as required; and MET service provider shall establish means by which such information can be supplied to the aerodromes concerned.	**14.1 General** 14.1.1 This Chapter sets out the standards for aerodrome meteorological offices. 14.1.2 MET service provider shall arrange one or more aerodrome meteorological offices which shall be adequate for the provision of the meteorological service required to satisfy the needs of international air navigation. 14.1.3 For an aerodrome without an aerodrome meteorological office located at the aerodrome: a) MET service provider shall arrange ~~designate~~ one or more aerodrome meteorological office(s) to supply meteorological information as required; and MET service provider shall establish means by which such information can be supplied to the aerodromes concerned.	- ปรับเพิ่มให้ตรงกับ Annex 3 และตามข้อบังคับ ฉบับที่ 19 CAAT มีอำนาจในการกำหนดให้ MET service provider จัดตั้ง AMO - 14.1.3 (14.1.2 เดิม) ปรับให้เป็นบริบทที่เรากำหนดให้ทาง METP จัดให้มีหน่วยงาน AMO ไม่ใช่การ designate
14.3 Use of forecasts MET service provider shall provide forecasts in accordance with Technical specifications in ICAO Annex 3, Appendix 5. 14.3.1 The issue of a new forecast by an aerodrome meteorological office, such as a routine aerodrome forecast, shall be understood to cancel automatically any forecast of the same type previously issued for the same place and for the same period of validity or part thereof.	**14.3 Use of forecasts and warnings** MET service provider shall provide forecasts in accordance with the Standards and Recommended Practices ~~Technical specifications~~ in ~~ICAO Annex 3, Appendix 5~~PANS-MET (Doc 10157), Chapter 4 and 5, Appendix 4 and 7. 14.3.1 The issue of a new forecast by an aerodrome meteorological office, such as a routine aerodrome forecast, shall be understood to cancel automatically any forecast of the same type previously issued for the same place and for the same period of validity or part thereof.	แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบท รวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้
14.3.2 Aerodrome forecasts 14.3.2.1 An aerodrome forecast shall be prepared in accordance with Asia and Pacific Regions (APAC) Air Navigation Plan and ASIA/PAC FASID (facilities and services implementation document), by the	**14.3.2 Terminal Aerodrome ~~f~~ Forecasts (TAF)** 14.3.2.1 An aerodrome forecast shall be prepared in accordance with Asia and Pacific Regions (APAC) Air Navigation Plan ~~and ASIA/PAC FASID (facilities and services implementation document),~~ by the	แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบท รวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้

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aerodrome meteorological office designated by MET service provider. *Note. — The aerodrome for which aerodrome forecasts are to be prepared and the period of validity of these forecasts are listed in the relevant facilities and services implementation document (FASID).* 14.3.2.2 An aerodrome forecast shall be issued at a specified time not earlier than one hour prior to the beginning of its validity period and consist of a concise statement of the expected meteorological conditions at an aerodrome for a specified period. 14.3.2.3 Aerodrome forecasts and amendments thereto shall be issued as TAF and include the following information in the order indicated: a) identification of the type of forecast; b) location indicator; c) time of issue of forecast; d) identification of a missing forecast, when applicable; e) date and period of validity of forecast; f) identification of a cancelled forecast, when applicable; g) surface wind; h) visibility; i) weather j) cloud; and k) expected significant changes to one or more of these elements during the period of validity. Optional elements shall be included in TAF in accordance with Asia and Pacific Regions (APAC) Air Navigation Plan. *Note. — The visibility included in TAF refers to the forecast prevailing visibility.* 14.3.2.4 Aerodrome meteorological offices preparing TAF shall keep the forecasts under continuous review and, when necessary, shall issue amendments promptly. The length of the forecast messages and the number of change and probability groups shall be kept to a minimum.	aerodrome meteorological office ~~designated by MET service provider~~. *Note. — The aerodrome for which aerodrome forecasts are to be prepared and the period of validity of these forecasts are listed in the relevant ~~facilities and services implementation document (FASID)~~ APAC electronic air navigation plan (eANP), Volume II.* 14.3.2.2 An aerodrome forecast shall be issued at a specified time not earlier than one hour prior to the beginning of its validity period and consist of a concise statement of the expected meteorological conditions at an aerodrome for a specified period. 14.3.2.3 Aerodrome forecasts and amendments thereto shall be issued as TAF, and include the following meteorological ~~information~~ elements ~~in the order indicated:~~ ~~a) identification of the type of forecast;~~ ~~b) location indicator;~~ ~~c) time of issue of forecast;~~ ~~d) identification of a missing forecast, when applicable;~~ ~~e) date and period of validity of forecast;~~ ~~f) identification of a cancelled forecast, when applicable;~~ a) surface wind; b) visibility; c) weather d) cloud; and e) expected significant changes to one or more of these elements during the period of validity. Optional elements shall be included in TAF in accordance with Asia and Pacific Regions (APAC) Air Navigation Plan. *Note. — The visibility included in TAF refers to the forecast prevailing visibility.* 14.3.2.4 Aerodrome meteorological offices preparing TAF shall keep the forecasts under continuous review and, when necessary, shall issue amendments promptly. The length of the forecast ~~messages~~	

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Note. — Guidance on methods to keep TAF under continuous review is given in Chapter 3 of the Manual of Aeronautical Meteorological Practice (Doc 8896). 14.3.2.5 TAF that cannot be kept under continuous review shall be cancelled. 14.3.2.6 The period of validity of a routine TAF should be not less than 6 hours and not more than 30 hours; the period of validity should be determined by Asia and Pacific Regions (APAC) Air Navigation Plan. Routine TAF valid for less than 12 hours should be issued every 3 hours and those valid for 12 to 30 hours should be issued every 6 hours. 14.3.2.7 When issuing TAF, aerodrome meteorological offices shall ensure that not more than one TAF is valid at an aerodrome at any given time.	and the number of change and probability groups shall be kept to a minimum. *Note. — Guidance on methods to keep TAF under continuous review is ~~given~~ contained in Chapter 3 of the Manual of Aeronautical Meteorological Practice (Doc 8896).* 14.3.2.5 TAF that cannot be kept under continuous review shall be cancelled. 14.3.2.6 The period of validity of a routine TAF should be not less than 6 hours and not more than 30 hours; the period of validity should be determined by Asia and Pacific Regions (APAC) Air Navigation Plan. Routine TAF valid for less than 12 hours should be issued every 3 hours and those valid for 12 to 30 hours should be issued every 6 hours. 14.3.2.7 When issuing TAF, aerodrome meteorological offices shall ensure that not more than one TAF is valid at an aerodrome at any given time. 14.3.2.8 TAF and amendments thereto shall be disseminated to National OPMET center (NOC) ~~international OPMET databanks and the centres designated by Asia and Pacific Regions (APAC) Air Navigation Plan~~ for the operation of aeronautical fixed service Internet-based services, in accordance with Asia and Pacific Regions (APAC) Air Navigation Plan.	
14.3.3 Landing forecasts 14.3.3.1 A landing forecast shall be prepared by the aerodrome meteorological office designated by MET service provider as determined by Asia and Pacific Regions (APAC) Air Navigation Plan; such forecasts are intended to meet the requirements of local users and of aircraft within about one hour's flying time from the aerodrome. 14.3.3.2 Landing forecasts shall be prepared in the form of a trend forecast. 14.3.3.3 A trend forecast shall consist of a concise statement of the expected significant changes in the meteorological conditions at that aerodrome to be appended to a local routine report, local special report,	**14.3.3 Landing forecasts (Trend forecasts)** 14.3.3.1 A landing forecast shall be prepared by the aerodrome meteorological office ~~designated by MET service provider~~ as determined by Asia and Pacific Regions (APAC) Air Navigation Plan; such forecasts are intended to meet the requirements of local users and of aircraft within about one hour's flying time from the aerodrome. 14.3.3.2 Landing forecasts shall be prepared in the form of a trend forecast. 14.3.3.3 A trend forecast shall consist of a concise statement of the expected significant changes in the meteorological conditions at	แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบท รวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้

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METAR or SPECI. The period of validity of a trend forecast shall be 2 hours from the time of the report which forms part of the landing forecast.	that aerodrome to be appended to a local routine report, local special report, METAR or SPECI. The period of validity of a trend forecast shall be 2 hours from the time of the report which forms part of the landing forecast. 14.3.3.4 The units and scales used in the trend forecast shall be the same as those used in the report to which it is appended.	
14.3.4 **Forecasts for take-off** 14.3.4.1 A forecast for take-off shall be prepared by the aerodrome meteorological office designated by MET service provider as agreed between aerodrome meteorological office and operators. 14.3.4.2 A forecast for take-off should refer to a specified period of time and should contain information on expected conditions over the runway complex in regard to surface wind direction and speed and any variations thereof, temperature, pressure (QNH), and any other elements as agreed locally. 14.3.4.3 A forecast for take-off should be supplied to operators and flight crew members on request within the 3 hours before the expected time of departure. 14.3.4.4 Aerodrome meteorological offices preparing forecasts for take-off should keep the forecasts under continuous review and, when necessary should issue amendments promptly.	14.3.4 **Forecasts for take-off** 14.3.4.1 A forecast for take-off shall be prepared by the aerodrome meteorological office ~~designated by MET service provider~~, as agreed between aerodrome meteorological office and operators. 14.3.4.2 A forecast for take-off should refer to a specified period of time and should contain information on expected conditions over the runway complex in regard to surface wind direction and speed and any variations thereof, temperature, pressure (QNH), and any other elements as agreed locally. 14.3.4.3 A forecast for take-off should be supplied to operators and flight crew members on request within the 3 hours before the expected time of departure. 14.3.4.4 Aerodrome meteorological offices preparing forecasts for take-off should keep the forecasts under continuous review and, when necessary should issue amendments promptly.	แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบท รวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้
14.3.5 **Area forecasts for low-level flights** 14.3.5.1 When the density of traffic operating below flight level 100 (or up to flight level 150 in mountainous areas, or higher, where necessary) warrants the routine issue and dissemination of area forecasts for such operations, the frequency of issue, the form and the fixed time or period of validity of those forecasts and the criteria for amendments thereto shall be determined by MET service provider in consultation with the users.	14.3.5 **Area forecasts for low-level flights** (GAMET, and area forecasts in chart form) 14.3.5.1 When the density of traffic operating below flight level 100 (or up to flight level 150 in mountainous areas, or higher, where necessary) warrants the routine issue and dissemination of area forecasts for such operations, the frequency of issue, the form and the fixed time or period of validity of those forecasts, the dissemination and the criteria for amendments thereto shall	แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบท รวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้

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14.3.5.2 When the density of traffic operating below flight level 100 warrants the issuance of AIRMET information in accordance with subsection 15.4.1, area forecasts for such operations shall be prepared in a format as agreed between MET service provider in the States concerned. When abbreviated plain language is used, the forecast shall be prepared as a GAMET area forecast, employing approved ICAO abbreviations and numerical values; when chart form is used, the forecast shall be prepared as a combination of forecasts of upper wind and upper-air temperature, and of SIGWX phenomena. The area forecasts shall be issued to cover the layer between the ground and flight level 100 (or up to flight level 150 in mountainous areas, or higher, where necessary) and shall contain information on en-route weather phenomena hazardous to low-level flights, in support of the issuance of AIRMET information, and additional information required by low-level flights 14.3.5.3 Area forecasts for low-level flights prepared in support of the issuance of AIRMET information shall be issued every 6 hours for a period of validity of 6 hours and transmitted to meteorological watch offices and/or aerodrome meteorological offices concerned not later than one hour prior to the beginning of their validity period.	be ~~determined~~ established by MET service provider in consultation with the users. 14.3.5.2 When the density of traffic operating below flight level 100 warrants the issuance of AIRMET information in accordance with subsection 15.4.1, area forecasts for such operations shall be prepared in a format as agreed between MET service provider in the States concerned. When abbreviated plain language is used, the forecast shall be prepared as a GAMET area forecast, ~~employing approved ICAO abbreviations and numerical values~~; when chart form is used, the forecast shall be prepared as a combination of forecasts of upper wind and upper-air temperature, and of SIGWX phenomena. The area forecasts shall be issued to cover the layer between the ground and flight level 100 (or up to flight level 150 in mountainous areas, or higher, where necessary) and shall contain information on en-route weather phenomena hazardous to low-level flights, in support of the issuance of AIRMET information, and additional information required by low-level flights 14.3.5.3 Area forecasts for low-level flights prepared in support of the issuance of AIRMET information shall be issued every 6 hours for a period of validity of 6 hours and transmitted to meteorological watch offices and/or aerodrome meteorological offices concerned not later than one hour prior to the beginning of their validity period. 14.3.5.4 Area forecasts for low-level flights prepared in support of the issuance of AIRMET information shall be issued by ~~exchanged between~~ aerodrome meteorological office~~s~~ ~~and/or meteorological watch offices~~ responsible for the issuance of flight documentation for low-level flights in the flight information regions concerned.	

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	14.3.5.5 Area forecasts for low-level flights (GAMET) prepared in support of the issuance of AIRMET information should be disseminated to the aeronautical fixed service Internet-based services. *Note.— Area forecasts for low-level flights in 14.3.5.4 and 14.3.5.5 are prepared in accordance with Asia and Pacific Regions (APAC) Air Navigation Plan, similar to the corresponding AIRMET information.*	
14.4 Aerodrome warnings MET service provider shall provide aerodrome warnings in accordance with Technical specifications in ICAO Annex 3, Appendix 6. 14.4.1 Aerodrome warnings shall be issued by the aerodrome meteorological office designated by MET service provider and shall give concise information of meteorological conditions which could adversely affect aircraft on the ground, including parked aircraft, and the aerodrome facilities and services. 14.4.2 Aerodrome warnings should be cancelled when the conditions are no longer occurring and/or no longer expected to occur at the aerodrome.	**14.4 Aerodrome warnings** MET service provider shall provide aerodrome warnings in accordance with ~~Technical specifications~~ the Standards and Recommended Practices in ~~ICAO Annex 3, Appendix 6~~PANS-MET (Doc 10157), Chapter 6 and Appendix 7. 14.4.1 Aerodrome warnings shall be issued by the aerodrome meteorological office~~ designated by MET service provider and~~ Aerodrome warnings shall give concise information of meteorological conditions which could adversely affect aircraft on the ground, including parked aircraft, and the aerodrome facilities and services. 14.4.2 *Aerodrome warnings should relate to the occurrence or expected occurrence of one or more of the following phenomena:* a) *tropical cyclone (to be included if the 10-minute mean surface wind speed at the aerodrome is expected to be 34 kt (17 m/s) or more)* b) *thunderstorm* c) hail d) snow (including the expected or observed snow accumulation) e) freezing precipitation f) frost g) hoar frost or rime h) sandstorm i) duststorm	แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบทรวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้

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	j) rising sand or dust k) strong surface wind and gusts l) squall m) volcanic ash (including volcanic ash deposition) n) tsunami o) toxic chemicals p) other phenomena as agreed locally. *Note.— Aerodrome warnings related to the occurrence or expected occurrence of tsunami are not required where a national public safety plan for tsunami is integrated with the "at risk" aerodrome concerned.* 14.4.~~2~~3 Aerodrome warnings should be cancelled when the conditions are no longer occurring and/or no longer expected to occur at the aerodrome. **14.5 Dissemination of aerodrome warnings** 14.5.1 Aerodrome warnings shall be disseminated in accordance with local arrangements to those concerned.	
14.5 Wind shear warnings and alerts MET service provider shall provide wind shear warnings in accordance with Technical specifications in ICAO Annex 3, Appendix 6. 14.5.1 Wind shear warnings shall be prepared by the aerodrome meteorological office designated by MET service provider for aerodromes where wind shear is considered a factor, in accordance with local arrangements with the appropriate air traffic services unit and operators concerned. Wind shear warnings shall give concise information on the observed or expected existence of wind shear which could adversely affect aircraft on the approach path or take-off path or during circling approach between runway level and 1 600 ft (500 m) above that level and aircraft on the runway during the landing roll or take-off run. Where local topography has been shown to produce significant wind shears at heights in excess of 1 600 ft	**14.~~5~~6 Wind shear warnings and alerts** MET service provider shall provide wind shear warnings in accordance with ~~Technical specifications~~ the Standards and Recommended Practices in ~~ICAO Annex 3, Appendix 6~~ PANS-MET (Doc 10157), Chapter 6 and Appendix 7. 14.~~5~~6.1 Wind shear warnings shall be issued ~~prepared~~ by the aerodrome meteorological office ~~designated by MET service provider~~ for aerodromes where wind shear is considered a factor, in accordance with local arrangements with the appropriate air traffic services unit and operators concerned. Wind shear warnings shall give concise information on the observed or expected existence of wind shear which could adversely affect aircraft on the approach path or take-off path or during circling approach between runway level and 1 600 ft (500 m) above that level and aircraft on the runway during the landing roll or take-off run. Where local topography has been	แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบท รวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้

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(500 m) above runway level, then 1 600 ft (500 m) shall not be considered restrictive. 14.5.2 Wind shear warnings for arriving aircraft and/or departing aircraft should be cancelled when aircraft reports indicate that wind shear no longer exists or, alternatively, after an agreed elapsed time. The criteria for the cancellation of a wind shear warning should be defined locally for each aerodrome, as agreed between MET service provider, the appropriate ATS authority and the operators concerned. 14.5.3 At aerodromes where wind shear is detected by automated, ground-based, wind shear remote-sensing or detection equipment, wind shear alerts generated by these systems shall be issued, Wind shear alerts shall give concise, up-to-date information related to the observed existence of wind shear involving a headwind/tailwind change of 15 kt (7.5 m/s) or more which could adversely affect aircraft on the final approach path or initial take-off part and aircraft on the runway during the landing roll or take-off run. 14.5.4 Wind shear alerts should be updated at least every minute, the wind shear alert should be cancelled as soon as the headwind/tailwind change falls below 15 kt (7.5 m/s).	shown to produce significant wind shears at heights in excess of 1 600 ft (500 m) above runway level, then 1 600 ft (500 m) shall not be considered restrictive. 14.~~5~~6.2 Wind shear warnings for arriving aircraft and/or departing aircraft should be cancelled when aircraft reports indicate that wind shear no longer exists or, alternatively, after an agreed elapsed time. The criteria for the cancellation of a wind shear warning should be defined locally for each aerodrome, as agreed between MET service provider, the appropriate ATS authority and the operators concerned. 14.~~5~~6.3 At aerodromes where wind shear is detected by automated, ground-based, wind shear remote-sensing or detection equipment, wind shear alerts generated by these systems shall be issued, Wind shear alerts shall give concise, up-to-date information related to the observed existence of wind shear ~~involving a headwind/tailwind change of 15 kt (7.5 m/s) or more~~ which could adversely affect aircraft on the final approach path or initial take-off part and aircraft on the runway during the landing roll or take-off run. ~~14.5.4 Wind shear alerts should be updated at least every minute, the wind shear alert should be cancelled as soon as the headwind/tailwind change falls below 15 kt (7.5 m/s).~~ **14.7 Dissemination of wind shear warnings and alerts** 14.7.1 The wind shear warnings shall be disseminated in accordance with local arrangements to those concerned. 14.7.2 The wind shear alerts shall be disseminated from automated, ground-based, wind shear remote-sensing or detection equipment in accordance with local arrangements to those concerned.	
14.6 Service for operators and flight crew members MET service provider shall provide service for operators and flight crew members in accordance with Technical specifications in ICAO Annex 3, Appendix 8.	**14.~~6~~8 Meteorological S~~s~~ervice for operators and flight crew members** MET service provider shall provide service for operators and flight crew members in accordance with ~~Technical specifications~~ the Standards	แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบท รวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้

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14.6.1 General Provisions 14.6.1.1 Aerodrome meteorological office shall supply meteorological information to operators and flight crew members for; a) pre-flight planning by operators; b) in-flight replanning by operators using centralized operational control of flight operations; c) use by flight crew members before departure; and d) aircraft in flight. 14.6.1.2 Meteorological information supplied to operators and flight crew members shall cover the flight in respect of time, altitude and geographical extent. Accordingly, the information shall relate to appropriate fixed times, or periods of time, and shall extend the aerodrome of intended landing, also covering the meteorological conditions expected between the aerodrome of intended landing and alternate aerodromes designated by the operator. 14.6.1.3 Meteorological information supplied to operators and flight crew members shall be up to date and include the following information, as agreed between MET service provider and the operators concerned: a) forecasts of: 1) upper wind and upper-air temperature; 2) upper-air humidity; 3) geopotential altitude of flight levels; 4) flight level and temperature of tropopause; 5) direction, speed and flight level of maximum wind; 6) SIGWX phenomena; and 7) cumulonimbus clouds, icing and turbulence; *Note 1.* — Forecasts of upper-air humidity and geopotential altitude of flight levels are used only in automatic flight planning and need not be displayed. *Note 2.* — Forecasts of cumulonimbus clouds, icing and turbulence are intended to be processed and, if necessary, visualized according to the specific thresholds relevant to user operations.	and Recommended Practices in ~~ICAO Annex 3, Appendix 8~~ PANS-MET (Doc 10157), Chapter 8 and Appendix 1. **14.68.1 General Provisions** 14.68.1.1 Aerodrome meteorological office shall supply meteorological information to operators and flight crew members for; a) pre-flight planning by operators; b) in-flight replanning by operators using centralized operational control of flight operations; c) use by flight crew members before departure; and d) aircraft in flight. 14.8.1.2 The meteorological service provider, in consultation with the operator, shall determine: a) the type and format of meteorological information to be supplied; and b) methods and means of supplying that information. 14.68.1.~~2~~3 Meteorological information supplied to operators and flight crew members shall cover the flight in respect of time, altitude and geographical extent. Accordingly, the information shall relate to appropriate fixed times, or periods of time, and shall extend the aerodrome of intended landing, also covering the meteorological conditions expected between the aerodrome of intended landing and alternate aerodromes designated by the operator. 14.68.1.~~3~~4 Meteorological information supplied to operators and flight crew members shall be up to date and include ~~the following information, as agreed between MET service provider and the operators concerned:~~ a) aerodrome and en-route observational information; and b) aerodrome and en-route forecast information. ~~a) forecasts of:~~ ~~1) upper wind and upper-air temperature;~~ ~~2) upper-air humidity;~~ ~~3) geopotential altitude of flight levels;~~	

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b) METAR or SPECI (including trend forecasts as issued in accordance with Asia and Pacific Regions (APAC) Air Navigation Plan) for the aerodromes of departure and intended landing, and for take-off, en-route and destination alternate aerodromes; c) TAF or amended TAF for the aerodromes of departure and intended landing, and for take-off, en-route and destination alternate aerodromes; d) forecasts for take-off; e) SIGMET information; *Note. — Appropriate special air-reports will be those not already used in the preparation of SIGMET* f) volcanic ash and tropical cyclone advisory information relevant to the whole route; g) as determined by Asia and Pacific Regions (APAC) Air Navigation Plan, GAMET area forecasts and/or area forecasts for low-level flights in chart form prepared in support of the issuance of AIRMET information, and AIRMET information for low-level flights relevant to the whole route; h) aerodrome warnings for the local aerodrome; i) meteorological satellite images; j) ground-based weather radar information; and k) space weather advisory information relevant to the whole route. 14.6.1.4 Forecasts listed under subsection 14.6.1.3 a) shall be generated from the digital forecasts provided by the WAFCs whenever these forecasts cover the intended flight path in respect of time, altitude and geographical extent, unless otherwise agreed between MET service provider and the operator concerned. 14.6.1.5 When forecasts are identified as being originated by the WAFCs, no modifications shall be made to their meteorological content.	~~4) flight level and temperature of tropopause;~~ ~~5) direction, speed and flight level of maximum wind;~~ ~~6) SIGWX phenomena; and~~ ~~7) cumulonimbus clouds, icing and turbulence;~~ ~~*Note 1. — Forecasts of upper-air humidity and geopotential altitude of flight levels are used only in automatic flight planning and need not be displayed.*~~ ~~*Note 2. — Forecasts of cumulonimbus clouds, icing and turbulence are intended to be processed and, if necessary, visualized according to the specific thresholds relevant to user operations.*~~ ~~b) METAR or SPECI (including trend forecasts as issued in accordance with Asia and Pacific Regions (APAC) Air Navigation Plan) for the aerodromes of departure and intended landing, and for take-off, en-route and destination alternate aerodromes;~~ ~~c) TAF or amended TAF for the aerodromes of departure and intended landing, and for take-off, en-route and destination alternate aerodromes;~~ ~~d) forecasts for take-off;~~ ~~e) SIGMET information;~~ ~~*Note. — Appropriate special air-reports will be those not already used in the preparation of SIGMET*~~ ~~f) volcanic ash and tropical cyclone advisory information relevant to the whole route;~~ ~~g) as determined by Asia and Pacific Regions (APAC) Air Navigation Plan, GAMET area forecasts and/or area forecasts for low-level flights in chart form prepared in support of the issuance of AIRMET information, and AIRMET information for low-level flights relevant to the whole route;~~ ~~h) aerodrome warnings for the local aerodrome;~~ ~~i) meteorological satellite images;~~ ~~j) ground-based weather radar information; and~~	

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14.6.1.6 Charts generated from the digital forecasts provided by the WAFCs shall be made available, as required by operators, for fixed areas of coverage as shown in ICAO Annex 3, Appendix 8, Figures A8-1, A8-2 and A8-3. 14.6.1.7 When forecasts of upper wind and upper-air temperature listed under subsection 14.6.1.3 a), 1) are supplied in chart form, they shall be fixed time prognostic charts for flight levels as specified in ICAO Annex 3, Appendix 2, 1.2.2, (a) When forecasts of SIGWX phenomena listed under subsection 14.6.1.3 a), 6) are supplied in chart form, they shall be fixed time prognostic charts for an atmospheric layer limited by flight levels as specified in ICAO Annex 3, Appendix 2, 1.3.2 and ICAO Annex 3, Appendix 5, 4.3.2. 14.6.1.8 The forecasts of upper wind and upper-air temperature and of SIGWX phenomena above flight level 100 requested for pre-flight planning and in-flight replanning by the operator shall be supplied as soon as they become available, but not later than 3 hours before departure, Other meteorological information requested for pre-flight planning and in-flight replanning by the operator shall be supplied as soon as is practicable. 14.6.1.9 When necessary, MET service provider providing service for operators and flight crew members shall initiate coordinating action with MET service provider of other States with a view to obtaining from them the reports and/or forecasts required. 14.6.1.10Meteorological information shall be supplied to operators and flight crew members at the location to be determined by MET service provider, after consultation with the operators and at the time to be agreed upon between the aerodrome meteorological office and the operator concerned. The service for pre-flight planning shall be confined to flights originating within the territory of the Thailand. At and aerodrome without an aerodrome meteorological office at the aerodrome, arrangements for the supply of meteorological information shall be as agreed upon between MET service provider and the operator concerned. **14.6.2 Briefing, consultation and display**	~~k) space weather advisory information relevant to the whole route.~~ 14.68.1.45 ~~F~~En-route forecasts ~~listed under subsection 14.6.1.3 a)~~ information shall be generated from the digital forecasts provided by the WAFCs whenever these forecasts cover the intended flight path in respect of time, altitude and geographical extent, unless otherwise agreed between MET service provider and the operator concerned. 14.68.1.56 When forecasts are identified as being originated by the WAFCs, no modifications shall be made to their meteorological content. ~~14.6.1.6 Charts generated from the digital forecasts provided by the WAFCs shall be made available, as required by operators, for fixed areas of coverage as shown in ICAO Annex 3, Appendix 8, Figures A8-1, A8-2 and A8-3.~~ ~~14.6.1.7 When forecasts of upper wind and upper-air temperature listed under subsection 14.6.1.3 a), 1) are supplied in chart form, they shall be fixed time prognostic charts for flight levels as specified in ICAO Annex 3, Appendix 2, 1.2.2, (a) When forecasts of SIGWX phenomena listed under subsection 14.6.1.3 a), 6) are supplied in chart form, they shall be fixed time prognostic charts for an atmospheric layer limited by flight levels as specified in ICAO Annex 3, Appendix 2, 1.3.2 and ICAO Annex 3, Appendix 5, 4.3.2.~~ 14.68.1.87The forecasts of upper wind and upper-air temperature and of SIGWX phenomena above flight level 100 requested for pre-flight planning and in-flight replanning by the operator shall be supplied as soon as they become available, but not later than 3 hours before departure, Other meteorological information requested for pre-flight planning and in-flight replanning by the operator shall be supplied as soon as is practicable. 14.8.1.8 Meteorological information for pre-flight planning and in-flight replanning by operators of helicopters flying to offshore structures should include data covering the layers from sea level to flight level 100. 14.68.1.9 When necessary, MET service provider ~~providing service for operators and flight crew members~~ shall initiate coordinating action	

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Note. — The requirements for the use of automated pre-flight information systems in providing briefing, consultation and display are given in subsection 14.6.4 14.6.2.1 Briefing and/or consultation shall be provided, on request, to flight crew members and/or other flight operations personnel. Its purpose shall be to supply the latest available information on existing and expected meteorological conditions along the route to be flown, at the aerodrome of intended landing, alternate aerodromes and other aerodromes as relevant, either to explain and amplify the information contained in the flight documentation or, if so agreed between MET service provider and the operator concerned, in lieu of flight documentation. 14.6.2.2 Meteorological information used for briefing, consultation and display shall include any or all of the information listed in subsection 14.6.1.3 14.6.2.3 If the aerodrome meteorological office expresses an opinion on the development of the meteorological conditions at an aerodrome which differs appreciably from the aerodrome forecast included in the flight documentation, the attention of flight crew members shall be drawn to the divergence. The portion of the briefing dealing with the divergence shall be recorded at time of briefing and this record shall be made available to the operator. 14.6.2.4 The required briefing, consultation, display and/or flight documentation shall normally be provided by the aerodrome meteorological office associated with the aerodrome of departure. At an aerodrome where these services are not available, arrangements to meet the requirements of flight crew members shall be as agreed upon between MET service provider and the operator concerned. In exceptional circumstances, such as an undue delay, the aerodrome meteorological office associated with the aerodrome shall provide or, if that is not practicable, arrange for the provision of a new briefing, consultation and/or flight documentation as necessary.	with MET service provider of other States with a view to obtaining from them the reports and/or forecasts required for operators and flight crew members. 14.~~6~~8.1.10Meteorological information shall be supplied to operators and flight crew members at the location to be determined by MET service provider, after consultation with the operators and at the time to be agreed upon between the aerodrome meteorological office and the operator concerned. The service for pre-flight planning shall be confined to flights originating within the territory of the Thailand. At and aerodrome without an aerodrome meteorological office at the aerodrome, arrangements for the supply of meteorological information shall be as agreed upon between MET service provider and the operator concerned. **14.~~6~~8.2 Briefing, consultation and display** *Note. — The requirements for the use of automated pre-flight information systems in providing briefing, consultation and display are ~~given~~ contained in subsection 14.~~6~~8.4* 14.~~6~~8.2.1 Briefing and/or consultation shall be provided, on request, to flight crew members and/or other flight operations personnel. Its purpose shall be to supply the latest available information on existing and expected meteorological conditions along the route to be flown, at the aerodrome of intended landing, alternate aerodromes and other aerodromes as relevant, either to explain and amplify the information contained in the flight documentation or, if so agreed between MET service provider and the operator concerned, in lieu of flight documentation. 14.~~6~~8.2.2 Meteorological information used for briefing, consultation and display shall include any or all of the information listed in subsection 14.~~6~~8.1.~~3~~4 14.~~6~~8.2.3 If the aerodrome meteorological office expresses an opinion on the development of the meteorological conditions at an aerodrome which differs appreciably from the aerodrome forecast included in the flight documentation, the attention of flight crew members shall be drawn to the divergence. The portion of the briefing dealing with	

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14.6.2.5 The flight crew member and/or other flight operations personnel for whom briefing, consultation and/or flight documentation has been requested should visit the aerodrome meteorological office at the time agreed upon between the aerodrome meteorological office and the operator concerned, Where local circumstances at an aerodrome make personal briefing or consultation impracticable, the aerodrome meteorological office should provide those services by telephone or other suitable telecommunications facilities. **14.6.3 Flight documentation** *Note. — The requirements for the use of automated pre-flight information systems in providing flight documentation are given in subsection 14.6.4* 14.6.3.1 Flight documentation to be made available shall comprise information listed under subsection 14.6.1.3 a) 1) and 6), b), c), e), f) and, if appropriate, g) and k). However, flight documentation for flights of two hours' duration or less, after a short stop or turnaround, shall be limited to the information operationally needed, as agreed between MET service provider and the operator concerned, but in all cases it shall at least comprise information on subsection 14.6.1.3 b), c), e), f) and, if appropriate, g) and k). 14.6.3.2 Whenever it becomes apparent that the meteorological information to be included in the flight documentation will differ materially from that made available for pre-flight planning and in flight replanning, the operator shall be advised immediately and, if practicable, be supplied with the revised information as agreed between the operator and the aerodrome meteorological office concerned. 14.6.3.3 In cases where a need for amendment arises after the flight documentation has been supplied and before take-off of the aircraft, the aerodrome meteorological office should, as agreed locally, issue the necessary amendment or updated information to the operator or to the local air traffic services unit, for transmission to the aircraft. **14.6.4 Automated pre-flight information systems**	the divergence shall be recorded at time of briefing and this record shall be made available to the operator. 14.68.2.4 The required briefing, consultation, display and/or flight documentation shall normally be provided by the aerodrome meteorological office associated with the aerodrome of departure. At an aerodrome where these services are not available, arrangements to meet the requirements of flight crew members shall be as agreed upon between MET service provider and the operator concerned. In exceptional circumstances, such as an undue delay, the aerodrome meteorological office associated with the aerodrome shall provide or, if that is not practicable, arrange for the provision of a new briefing, consultation and/or flight documentation as necessary. 14.68.2.5 The flight crew member and/or other flight operations personnel for whom briefing, consultation and/or flight documentation has been requested should visit the aerodrome meteorological office at the time agreed upon between the aerodrome meteorological office and the operator concerned, Where local circumstances at an aerodrome make personal briefing or consultation impracticable, the aerodrome meteorological office should provide those services by telephone or other suitable telecommunications facilities. 14.8.2.6 The material displayed should be readily accessible to the flight crew members or other flight operations personnel concerned. **14.68.3 Flight documentation** *Note. — The requirements for the use of automated pre-flight information systems in providing flight documentation are ~~given~~ contained in subsection 14.68.4* 14.68.3.1 Flight documentation to be made available shall comprise information listed under subsection 14.68.1.34 ~~a) 1) and 6), b), c), e), f) and, if appropriate, g) and k). However, flight documentation for flights of two hours' duration or less, after a short stop or turnaround, shall be limited to the information operationally needed, as agreed between MET service provider and the operator concerned, but in all cases it shall at~~	

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14.6.4.1 Where MET service provider uses automated pre-flight information systems to supply and display meteorological information to operators and flight crew members for self-briefing, flight planning and flight documentation purposes, the information supplied and displayed shall comply with the relevant provisions in subsection 14.6.1 to 14.6.3 inclusive. 14.6.4.2 Automated pre-flight information systems providing for a harmonized, common point of access to meteorological information and aeronautical information services information by operators, flight crew members and other aeronautical personnel concerned should be as agreed between MET service provider and the civil aviation authority or the agency to which the authority to provide service has been delegated in accordance with Annex 15, 2.1.1 c). *Note. — The meteorological and aeronautical information services information concerned is specified in subsection 14.6.1 to 14.6.3 and Appendix 8 and in the Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM, Doc 10066), 5.5, respectively.* 14.6.4.3 Where automated pre-flight information systems are used to provide for a harmonized, common point of access to meteorological information and aeronautical information services information by operators, flight crew members and other aeronautical personnel concerned, MET service provider shall remain responsible for the quality control and quality management of meteorological information provided by means of such systems in accordance with Chapter 8, subsection 8.2. *Note. — The responsibilities relating to aeronautical information services information and the quality assurance of the information are given in ICAO Annex 15, Chapters 1, 2 and 3.* **14.6.5 Information for aircraft in flight** 14.6.5.1 Meteorological information for use by aircraft in flight shall be supplied by an aerodrome meteorological office or meteorological watch office to its associated air traffic services unit and through D-VOLMET or VOLMET broadcasts as determined by Asia and Pacific Regions (APAC) Air	~~least comprise information on subsection 14.6.1.3 b), c), e), f) and, if appropriate, g) and k).~~ 14.68.3.2 Whenever it becomes apparent that the meteorological information to be included in the flight documentation will differ materially from that made available for pre-flight planning and in flight replanning, the operator shall be advised immediately and, if practicable, be supplied with the revised information as agreed between the operator and the aerodrome meteorological office concerned. 14.68.3.3 In cases where a need for amendment arises after the flight documentation has been supplied and before take-off of the aircraft, the aerodrome meteorological office should, as agreed locally, issue the necessary amendment or updated information to the operator or to the local air traffic services unit, for transmission to the aircraft. 14.8.3.4 The flight documentation related to concatenated route-specific upper wind and upper-air temperature forecasts should be provided as agreed between the meteorological service provider and the operator concerned. *Note.— Guidance on the design, formulation and use of concatenated charts is contained in the* Manual of Aeronautical Meteorological Practice *(Doc 8896).* 14.8.3.5 Meteorological information received from other meteorological offices shall be included in flight documentation without modification. 14.8.3.6 Charts included in flight documentation should have a high standard of clarity and legibility. *Note.— The details of the characteristics of charts to be included in flight documentation are contained the* Procedures for Air Navigation Services – Meteorology *(PANS-MET, Doc 10157), Section 8.2.3.1.* **14.68.4 Automated pre-flight information systems** 14.68.4.1 Where MET service provider uses automated pre-flight information systems to supply and display meteorological information to operators and flight crew members for self-briefing, flight planning and flight documentation purposes, the information supplied and displayed	

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Navigation Plan. Meteorological information for planning by the operator for aircraft in flight shall be supplied on request, as agreed between MET service provider and the operator concerned. 14.6.5.2 Meteorological information for use by aircraft in flight shall be supplied to air traffic services units in accordance with the specifications of Chapter 16. 14.6.5.3 Meteorological information shall be supplied through D-VOLMET or VOLMET broadcasts in accordance with the specifications of Chapter 17.	shall comply with the relevant provisions in subsection 14.~~6~~8.1 to 14.~~6~~8.3 inclusive. 14.~~6~~8.4.2 Automated pre-flight information systems providing for a harmonized, common point of access to meteorological information and aeronautical information services information by operators, flight crew members and other aeronautical personnel concerned should be as agreed between MET service provider and the civil aviation authority or the agency to which the authority to provide service has been delegated in accordance with Annex 15, 2.1.1 c). *Note. — The meteorological and aeronautical information services information concerned is specified in subsection 14.~~6~~8.1 to 14.~~6~~8.3 and ~~Appendix 8~~ in the PANS-MET (Doc 10157), Chapter 8, and in the Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM, Doc 10066), 5.5, respectively.* 14.~~6~~8.4.3 Where automated pre-flight information systems are used to provide for a harmonized, common point of access to meteorological information and aeronautical information services information by operators, flight crew members and other aeronautical personnel concerned, MET service provider shall remain responsible for ensuring that the quality control and quality management of meteorological information are provided by MET service provider by means of such systems in accordance with Chapter 8, subsection 8.2. *Note. — The responsibilities relating to aeronautical information services information and the quality assurance of the information are ~~given~~ contained in ICAO Annex 15, Chapters 1, 2 and 3.* 14.8.4.4 Automated pre-flight information systems providing self-briefing facilities shall provide for access by operators and flight crew members to consultation, as necessary, with an aerodrome meteorological office by telephone or other suitable telecommunications means. **14.~~6~~8.5 Meteorological ~~i~~information for aircraft in flight** 14.~~6~~8.5.1 Meteorological information for use by aircraft in flight shall be supplied by an aerodrome meteorological office or meteorological	

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	watch office to its associated air traffic services unit and through D-VOLMET or VOLMET broadcasts as determined by Asia and Pacific Regions (APAC) Air Navigation Plan. Meteorological information for planning by the operator for aircraft in flight shall be supplied on request, as agreed between MET service provider and the operator concerned. 14.~~6~~8.5.2 Meteorological information for use by aircraft in flight shall be supplied to air traffic services units in accordance with the specifications of Chapter 16. 14.8.5.3 If an aircraft in flight requests meteorological information, the aerodrome meteorological office or meteorological watch office which receives the request should arrange to supply the information with the assistance, if necessary, of another aerodrome meteorological office or meteorological watch office. 14.~~6~~8.5.~~3~~4 Meteorological information shall be supplied through D-VOLMET or VOLMET broadcasts in accordance with the specifications of Chapter 17.	
14.7 Aeronautical climatological information MET service provider shall provide aeronautical climatological information in accordance with Technical specifications in ICAO Annex 3, Appendix 7.	**14.~~7~~9 Aeronautical climatological information** MET service provider shall provide aeronautical climatological information in accordance with the Standards and Recommended Practices ~~Technical specifications~~ in ~~ICAO Annex 3, Appendix 7~~ PANS-MET (Doc 10157), Chapter 7.	แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบท รวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้
Chapter 15 Standards for Meteorological Watch Offices		
15.2 Meteorological Watch Office function 15.2.1 An MWO shall: a) maintain continuous watch over meteorological conditions affecting flight operations within its area of responsibility; b) prepare SIGMET and other information relating to its area of responsibility; c) supply SIGMET information and, as required, other meteorological information to associated air traffic services units;	**15.2 Meteorological Watch Office function** 15.2.1 An MWO shall: a) maintain continuous watch over meteorological conditions affecting flight operations within its area of responsibility; b) prepare SIGMET and other information relating to its area of responsibility;	แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบท รวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้

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d) disseminate SIGMET information; e) when required by Asia/Pacific air navigation agreement, in accordance with 15.4.1: 1) prepare AIRMET information related to its area of responsibility; 2) supply AIRMET information to associated air traffic services units; and 3) disseminate AIRMET information; f) supply information received on pre-eruption volcanic activity, a volcanic eruption and volcanic ash cloud for which a SIGMET has not already been issued, to its associated area control centre (ACC)/flight information centre (FIC), as agreed between MET service provider and ATS provider, and to its associated VAAC as determined by Asia and Pacific Regions (APAC) Air Navigation Plan; and g) supply information received concerning the release of radioactive materials into the atmosphere, in the area for which it maintains watch or adjacent areas, to its associated ACC/FIC, as agreed between MET service provider and ATS provider concerned, and to AIS provider, as agreed between MET service provider and CAAT. The information shall comprise location, date and time of the release, and forecast trajectories of the radioactive materials.	c) supply SIGMET information and, as required, other meteorological information to associated air traffic services units; d) disseminate SIGMET information; e) when required by Asia/Pacific air navigation agreement, in accordance with 15.4.1: 4) prepare AIRMET information related to its area of responsibility; 5) supply AIRMET information to associated air traffic services units; and 6) disseminate AIRMET information; f) supply information received on pre-eruption volcanic activity, a volcanic eruption and volcanic ash cloud for which a SIGMET has not already been issued, to its associated area control centre (ACC)/flight information centre (FIC), as agreed between MET service provider and appropriate ATS provider, and to its associated VAAC as determined by Asia and Pacific Regions (APAC) Air Navigation Plan; and g) supply information received concerning the release of radioactive materials into the atmosphere, in the area for which it maintains watch or adjacent areas, to its associated ACC/FIC, as agreed between MET service provider and appropriate ATS provider ~~concerned~~, and to AIS provider, as agreed between MET service provider and CAAT. The information shall comprise location, date and time of the release, and forecast trajectories of the radioactive materials.	
15.3 SIGMET information MET service provider shall provide SIGMET information in accordance with Technical specifications in ICAO Annex 3, Appendix 6.	**15.3 SIGMET information** MET service provider shall provide SIGMET information in accordance with ~~Technical specifications~~ the Standards and	แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบท รวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้

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15.3.1 SIGMET information shall be issued by a meteorological watch office and shall give a concise description in abbreviated plain language concerning the occurrence or expected occurrence of specified en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations, and of the development of those phenomena in time and space. 15.3.2 SIGMET information shall be cancelled when the phenomena are no longer occurring or are no longer expected to occur in the area. 15.3.3 The period of validity of a SIGMET message shall be not more than 4 hours. In the special case of SIGMET messages for volcanic ash cloud and tropical cyclones, the period of validity shall be extended up to 6 hours. 15.3.4 SIGMET messages concerning volcanic ash cloud and tropical cyclones should be based on advisory information provided by VAACs and TCACs, respectively, designated by Asia and Pacific Regions (APAC) Air Navigation Plan. 15.3.5 Close coordination shall be maintained between the meteorological watch office and the associated area control centre/flight information centre to ensure that information on volcanic ash included in SIGMET and NOTAM messages is consistent. 15.3.6 SIGMET messages shall be issued not more than 4 hours before the commencement of the period of validity. In the special case of SIGMET messages for volcanic ash cloud and tropical cyclones, these messages shall be issued as soon as practicable but not more than 12 hours before the commencement of the period of validity. SIGMET messages for volcanic ash and tropical cyclones shall be updated at least every 6 hours.	Recommended Practices in ~~ICAO Annex 3,~~ PANS-MET (Doc 10157), Chapter 6 and Appendix 7 ~~Appendix 6~~. 15.3.1 SIGMET information shall be issued by a meteorological watch office and shall give a concise description ~~in abbreviated plain language~~ concerning the occurrence or expected occurrence of specified en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations, and of the development of those phenomena in time and space. One of the following phenomena shall be included in SIGMET information: a) thunderstorm; b) tropical cyclone; c) turbulence; d) icing; e) mountain wave; f) duststorm; g) sandstorm; h) volcanic ash; and i) radioactive cloud 15.3.2 SIGMET information shall be cancelled when the phenomena are no longer occurring or are no longer expected to occur in the area. 15.3.3 The period of validity of a SIGMET ~~message~~ information shall be not more than 4 hours. In the special case of SIGMET ~~messages~~ information for volcanic ash cloud and tropical cyclones, the period of validity shall be extended up to 6 hours. 15.3.4 SIGMET ~~messages~~ information concerning volcanic ash cloud and tropical cyclones should be based on advisory information provided by VAACs and TCACs, respectively, designated by Asia and Pacific Regions (APAC) Air Navigation Plan. 15.3.5 Close coordination shall be maintained between the meteorological watch office and the associated area control centre/flight information centre to ensure that information on	

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	volcanic ash included in SIGMET and NOTAM ~~messages~~ is consistent. 15.3.6 SIGMET ~~messages~~ information shall be issued not more than 4 hours before the commencement of the period of validity. In the special case of SIGMET ~~messages~~ information for volcanic ash cloud and tropical cyclones, ~~these messages~~ this information shall be issued as soon as practicable but not more than 12 hours before the commencement of the period of validity. SIGMET ~~messages~~ information for volcanic ash and tropical cyclones shall be updated at least every 6 hours. 15.3.7 In cases where the airspace is divided into an FIR and an upper flight information region (UIR), the SIGMET should be identified by the location indicator of the air traffic services unit serving the FIR. *Note.— SIGMET information applies to the whole airspace within the lateral limits of the FIR, i.e. to the FIR and to the UIR. The particular areas and/or flight levels affected by the meteorological phenomena prompting the issuance of the SIGMET are included in SIGMET information.* **15.4 Dissemination of SIGMET information** 15.4.1 SIGMET information shall be disseminated to meteorological watch offices, WAFCs and to other meteorological offices in accordance with Asia/Pacific air navigation agreement. SIGMET information for volcanic ash shall also be disseminated to volcanic ash advisory centres. 15.4.2 SIGMET information shall be disseminated to international OPMET databanks and the centres designated by Asia/Pacific air navigation agreement for the operation of aeronautical fixed service Internet-based services, in accordance with Asia/Pacific air navigation agreement.	

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15.4 AIRMET Information MET service provider shall provide AIRMET information in accordance with Technical specifications in ICAO Annex 3, Appendix 6. 15.4.1 AIRMET information shall be issued by a meteorological watch office in accordance with Asia and Pacific Regions (APAC) Air Navigation Plan taking into account the density of air traffic operating below flight level 100. AIRMET information shall give a concise description in abbreviated plain language concerning the occurrence and/or expected occurrence of specified en-route weather phenomena, which have not been included in Section I of the area forecast for low-level flights issued in accordance with Chapter 14, subsection 14.3.5 and which may affect the safety of low-level flights, and of the development of those phenomena in time and space. 15.4.2 AIRMET information shall be cancelled when the phenomena are no longer occurring or are no longer expected to occur in the area. 15.4.3 The period of validity of an AIRMET message shall be not more than 4 hours.	15.~~4~~5 AIRMET Information MET service provider shall provide AIRMET information in accordance with ~~Technical specifications~~ the Standards and Recommended Practices in ~~ICAO Annex 3, Appendix 6~~ PANS-MET (Doc 10157), Chapter 6 and Appendix 7. 15.~~4~~5.1 AIRMET information shall be issued by a meteorological watch office in accordance with Asia and Pacific Regions (APAC) Air Navigation Plan taking into account the density of air traffic operating below flight level 100 (or below flight level 150 in mountainous areas, or higher, where necessary). AIRMET information shall give a concise ~~description in abbreviated plain language~~ concerning the occurrence and/or expected occurrence of specified en-route weather phenomena, which have not been included in Section I of the area forecast for low-level flights issued in accordance with Chapter 14, subsection 14.3.5 and which may affect the safety of low-level flights, and of the development of those phenomena in time and space. One of the following phenomena shall be included in AIRMET information: a) surface wind speed; b) surface visibility; c) thunderstorms; d) mountain obscuration; e) cloud; f) icing; g) turbulence; and	แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบทรวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้

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	h) mountain wave 15.~~4~~5.2 AIRMET information shall be cancelled when the phenomena are no longer occurring or are no longer expected to occur in the area. 15.~~4~~5.3 The period of validity of an AIRMET ~~message~~ information shall be not more than 4 hours. **15.6 Dissemination of AIRMET information** 15.6.1 AIRMET information should be disseminated to meteorological watch offices in adjacent FIRs and to other meteorological watch offices or aerodrome meteorological offices, as agreed between the meteorological authorities concerned. 15.6.2 AIRMET information should be transmitted to international operational meteorological databanks and the centres designated by Asia/Pacific air navigation agreement for the operation of aeronautical fixed service Internet-based services, in accordance with Asia/Pacific air navigation agreement.	

15.5 Aircraft observations and reports MET service provider shall provide services related to aircraft observations and reports in accordance with Technical specifications in ICAO Annex 3, Appendix 4. 15.5.1 **Relay of air-reports by air traffic services units** 15.5.1.1 MET service provider shall make arrangements with appropriate ATS provider to ensure that, on receipt by the ATS units of: a) special air-reports by voice communications, the ATS units relay them without delay to their associated meteorological watch office; and b) routine and special air-reports by data link communications, the ATS units relay them without delay to their associated meteorological watch office, the WAFCs and the centres designated by Asia/Pacific air navigation agreement for the operation of aeronautical fixed service Internet-based services. 15.5.1.2 On receipt of a special air-report from the associated ACC or FIC, the MWO shall: a) issue SIGMET information based on the special air-report; or b) send the special air-report for onward transmission to MWOs, WAFCs, and other meteorological offices in accordance with Asia/Pacific air navigation agreement in the case that the issuance of SIGMET information is not warranted (e.g., the phenomenon concerned is of transient nature). 15.5.2 **Types of aircraft observations** The following aircraft observations shall be made:	15.~~5~~7 Aircraft observations and reports MET service provider shall provide services related to aircraft observations and reports in accordance with ~~Technical specifications~~ the Standards and Recommended Practices in ~~ICAO Annex 3,~~ PANS-MET (Doc 10157), Chapter 3 and Appendix 3 ~~Appendix 4~~. 15.~~5~~7.1 **Relay of air-reports by air traffic services units** 15.~~5~~7.1.1 MET service provider shall make arrangements with appropriate ATS provider to ensure that, on receipt by the ATS units of: a) special air-reports by voice communications, the ATS units relay them without delay to their associated meteorological watch office; and b) routine and special air-reports by data link communications, the ATS units relay them without delay to their associated meteorological watch office, the WAFCs and the centres designated by Asia/Pacific air navigation agreement for the operation of aeronautical fixed service Internet-based services. 15.~~5~~7.1.2 On receipt of a special air-report from the associated ACC or FIC, the MWO shall: a) issue SIGMET information based on the special air-report; or b) send the special air-report for onward transmission to MWOs, WAFCs, and other meteorological offices in accordance with Asia/Pacific air navigation agreement in the case that the issuance of SIGMET information is not warranted (e.g., the phenomenon concerned is of transient nature). 15.~~5~~7.2 **Types of aircraft observations**	แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบท รวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้

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a) routine aircraft observations during en-route and climb-out phases of the flight; and b) special and other non-routine aircraft observations during any phase of the flight.	The following aircraft observations shall be made: a) routine aircraft observations during en-route and climb-out phases of the flight; and b) special and other non-routine aircraft observations during any phase of the flight.	
15.5.3 **Routine aircraft observations – designation**	15.57.3 **Routine aircraft observations – designation**	
15.5.3.1 When air-ground data link is used and automatic dependent surveillance (ADS-C) or secondary surveillance radar (SSR) Mode S is being applied, automated routine observations should be made every 15 minutes during the en-route phase and every 30 seconds during the climb-out phase for the first 10 minutes of the flight.	15.57.3.1 When air-ground data link is used and automatic dependent surveillance (ADS-C) or secondary surveillance radar (SSR) Mode S is being applied, automated routine observations should be made every 15 minutes during the en-route phase and every 30 seconds during the climb-out phase for the first 10 minutes of the flight.	
15.5.3.2 For helicopter operations to and from aerodromes on offshore structures, routine observations should be made from helicopters at points and times as agreed between the meteorological authorities and the helicopter operators concerned.	15.57.3.2 For helicopter operations to and from aerodromes on offshore structures, routine observations should be made from helicopters at points and times as agreed between the MET service provider ~~meteorological authorities~~ and the helicopter operators concerned.	
15.5.3.3 In the case of air routes with high-density air traffic (e.g. organized tracks), an aircraft from among the aircraft operating at each flight level shall be designated, at approximately hourly intervals, to make routine observations in accordance with subsection 15.5.3.1. The designation procedures shall be in accordance with Asia/Pacific air navigation agreement.	15.57.3.3 In the case of air routes with high-density air traffic (e.g. organized tracks), an aircraft from among the aircraft operating at each flight level shall be designated, at approximately hourly intervals, to make routine observations in accordance with subsection 15.57.3.1. The designation procedures shall be in accordance with Asia/Pacific air navigation agreement.	
15.5.3.4 In the case of the requirement to report during the climb-out phase, an aircraft shall be designated, at approximately hourly intervals, at each aerodrome to make routine observations in accordance with subsection 15.5.3.1.	15.57.3.4 In the case of the requirement to report during the climb-out phase, an aircraft shall be designated, at approximately hourly intervals, at each aerodrome to make routine observations in accordance with subsection 15.57.3.1.	
15.5.4 **Routine aircraft observations – exemptions**	15.57.4 **Routine aircraft observations – exemptions**	

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15.5.4.1 Aircraft not equipped with air-ground data link shall be exempted from making routine aircraft observations.	15.57.4.1 Aircraft not equipped with air-ground data link shall be exempted from making routine aircraft observations.	
15.5.5 **Special aircraft observations**	15.57.5 **Special aircraft observations**	
15.5.5.1 Special observations shall be made by all aircraft whenever the following conditions are encountered or observed:	15.57.5.1 Special observations shall be made by all aircraft whenever the following conditions are encountered or observed:	
a) moderate or severe turbulence; or	a) moderate or severe turbulence; or	
b) moderate or severe icing; or	b) moderate or severe icing; or	
c) severe mountain wave; or	c) severe mountain wave; or	
d) thunderstorms, without hail, that are obscured, embedded, widespread or in squall lines; or	d) thunderstorms, without hail, that are obscured, embedded, widespread or in squall lines; or	
e) thunderstorms, with hail, that are obscured, embedded, widespread or in squall lines; or	e) thunderstorms, with hail, that are obscured, embedded, widespread or in squall lines; or	
f) heavy dust storm or heavy sandstorm; or	f) heavy dust storm or heavy sandstorm; or	
g) volcanic ash cloud.	g) volcanic ash cloud.	
h) pre-eruption volcanic activity or a volcanic eruption; or	h) pre-eruption volcanic activity or a volcanic eruption; or	
Note.— Pre-eruption volcanic activity in this context means unusual and/or increasing volcanic activity which could presage a volcanic eruption.	*Note.— Pre-eruption volcanic activity in this context means unusual and/or increasing volcanic activity which could presage a volcanic eruption.*	
i) as of 5 November 2020, runway braking action encountered is not as good as reported.	i) ~~as of 5 November 2020,~~ runway braking action encountered is not as good as reported.	
15.5.6 **Other non-routine aircraft observations**	15.57.6 **Other non-routine aircraft observations and reports**	
15.5.6.1 When other meteorological conditions not listed under subsection 15.5.5.1, e.g. wind shear, are encountered and which, in the opinion of the pilot-in-command, may affect the safety or markedly affect the efficiency of other aircraft operations, the pilot-in-command shall advise the appropriate air traffic services unit as soon as practicable.	15.57.6.1 When other meteorological conditions not listed under subsection 15.5.5.1, e.g. wind shear, are encountered and which, in the opinion of the pilot-in-command, may affect the safety or markedly affect the efficiency of other aircraft operations, the pilot-in-command shall advise the appropriate air traffic services unit as soon as practicable.	

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Note. — Icing, turbulence and, to a large extent, wind shear are elements which, for the time being, cannot be satisfactorily observed from the ground and for which in most cases aircraft observations represent the only available evidence.	~~*Note. — Icing, turbulence and, to a large extent, wind shear are elements which, for the time being, cannot be satisfactorily observed from the ground and for which in most cases aircraft observations represent the only available evidence.*~~	
15.5.7 **Reporting of aircraft observations during flight**	15.~~5~~7.7 **Reporting of aircraft observations during flight**	
15.5.7.1 Aircraft observations shall be reported by air-ground data link. Where air ground data link is not available or appropriate, special and other non-routine aircraft observations during flight shall be reported by voice communications in according to ICAO DOC 4444, Appendix 1, MODEL AIREP SPECIAL.	15.~~5~~7.7.1 Aircraft observations shall be reported by air-ground data link. Where air ground data link is not available or appropriate, special and other non-routine aircraft observations during flight shall be reported by voice communications in according to ICAO DOC 4444, Appendix 1, MODEL AIREP SPECIAL.	
15.5.7.2 Aircraft observations shall be reported during flight at the time the observation is made or as soon thereafter as is practicable.	15.~~5~~7.7.2 Aircraft observations shall be reported during flight at the time the observation is made or as soon thereafter as is practicable.	
15.5.7.3 Aircraft observations shall be reported as air-reports.	15.~~5~~7.7.3 Routine and special ~~A~~ aircraft observations shall be reported as routine and special air-reports, respectively. Routine and special air-reports reported by air-ground data link shall contain, as a minimum, the following meteoorlogical information: a) wind direction; b) wind speed; c) air temperature; and d) condition prompting the issuance of the air-report (only applicable for special air-reports).	
15.5.8 **Recording and post-flight reporting of aircraft observations of volcanic activity**	15.~~5~~7.8 **Recording and post-flight reporting of aircraft observations of volcanic activity**	
15.5.8.1 Special aircraft observations of pre-eruption volcanic activity, a volcanic eruption or volcanic ash cloud shall be recorded on the special air-report of volcanic activity form in according to ICAO DOC 4444, Appendix 1, MODEL VOLCANIC ACTIVITY REPORT (VAR): to be used for post-flight reporting. A copy of the form shall be included with the flight documentation provided to flights operating on routes which, in the opinion of MET service provider concerned, could be affected by volcanic ash clouds.	15.~~5~~7.8.1 Special aircraft observations of pre-eruption volcanic activity, a volcanic eruption or volcanic ash cloud shall be recorded on the special air-report of volcanic activity form in according to ICAO DOC 4444, Appendix 1, MODEL VOLCANIC ACTIVITY REPORT (VAR): to be used for post-flight reporting. A copy of the form shall be included with the flight documentation	

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	provided to flights operating on routes which, in the opinion of MET service provider concerned, could be affected by volcanic ash clouds.	
	15.8 Dissemination of air-reports	
	15.8.1 The meteorological watch office shall transmit without delay the special air-reports received by voice communications to the world area forecast centres (WAFCs) and the centres designated by Asia/Pacific air navigation agreement for the operation of aeronautical fixed service Internet-based services.	
	15.8.2 The meteorological watch office shall transmit without delay special air-reports of pre-eruption volcanic activity, a volcanic eruption or volcanic ash cloud received to the associated volcanic ash advisory centres.	
	15.8.3 When a special air-report is received at the meteorological watch office but the forecaster considers that the phenomenon causing the report is not expected to persist and, therefore, does not warrant issuance of a SIGMET, the special air-report shall be disseminated in the same way that SIGMET information is disseminated in accordance with 15.4.1, i.e. to meteorological watch offices, WAFCs, and other meteorological offices in accordance with Asia/Pacific air navigation agreement.	
	15.8.4 Air-reports received at WAFCs shall be further disseminated as basic meteorological data.	
	Note.— The dissemination of basic meteorological data is normally carried out on the World Meteorological Organization (WMO) Global Telecommunication System.	
	15.8.5 Air-reports shall be exchanged in the format in which they are received.	

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	15.8.6 Where supplementary dissemination of air-reports is required to satisfy special aeronautical or meteorological requirements, arrangements for such dissemination should be agreed between the meteorological authorities concerned.	
Chapter 16 Information for Air Traffic Services, Search and Rescue Services and Aeronautical Information Services		
16.1 General 16.1.1 This Chapter sets out the standards for Information for Air Traffic Services, Search and Rescue Services and Aeronautical Information Services 16.1.2 MET service provider shall provide information to Air Traffic Services, Search and Rescue Services and Aeronautical Information Services in accordance with Technical specifications in ICAO Annex 3, Appendix 9.	**16.1 General** 16.1.1 This Chapter sets out the standards for Information for Air Traffic Services, Search and Rescue Services and Aeronautical Information Services 16.1.2 MET servicer provider shall arrange agreement with appropriate ATS authority. An agreement shall be established to cover, among other things: a) the provision in air traffic services units of displays related to integrated automatic systems; b) the calibration and maintenance of these displays/instruments; c) the use to be made of these displays/instruments by air traffic services personnel; d) as and where necessary, supplementary visual observations (for example, of meteorological phenomena of operational significance in the climb-out and approach areas) if and when made by air traffic services personnel to update or supplement the information supplied by the meteorological station; e) meteorological information obtained from aircraft taking off or landing (for example, on wind shear); and f) if available, meteorological information obtained from ground weather radar. 16.1.3 MET servicer provider shall arrange agreement with Search and Rescue Service Provider. 16.1.4 MET servicer provider shall arrange agreement with AIS provider. 16.1.25 MET service provider shall provide information to Air Traffic Services, Search and Rescue Services and Aeronautical Information Services in accordance with ~~Technical specifications~~ the Standards and	แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบท รวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้

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	Recommended Practices in ~~ICAO Annex 3, Appendix 9~~ PANS-MET (Doc 10157), Chapter 9.	
16.2 Information for air traffic services units. 16.2.1 MET service provider shall designate an aerodrome meteorological office or meteorological watch office to be associated with each air traffic services unit. The associated aerodrome meteorological office or meteorological watch office shall, after coordination with the air traffic services unit, supply, or arrange for the supply of, up-to-date meteorological information to the unit as necessary for the conduct of its functions. 16.2.2 An aerodrome meteorological office should be associated with an aerodrome control tower or approach control unit for the provision of meteorological information. 16.2.3 A meteorological watch office shall be associated with a flight information centre or an area control centre for the provision of meteorological information. 16.2.4 Where, owing to local circumstances, it is convenient for the duties of an associated aerodrome meteorological office or meteorological watch office to be shared between two or more aerodrome meteorological offices or meteorological watch offices, the division of responsibility should be determined by MET service provider in consultation with the appropriate ATS provider. 16.2.5 Any meteorological information requested by an air traffic services unit in connection with an aircraft emergency shall be supplied as rapidly as possible.	**16.2 Information for air traffic services units.** 16.2.1 MET service provider shall ~~designate~~ arrange an aerodrome meteorological office or meteorological watch office to be associated with each air traffic services unit. The associated aerodrome meteorological office or meteorological watch office shall, after coordination with the air traffic services unit, supply, or arrange for the supply of, up-to-date meteorological information to the unit as necessary for the conduct of its functions. 16.2.2 An aerodrome meteorological office should be associated with an aerodrome control tower or approach control unit for the provision of meteorological information. 16.2.3 A meteorological watch office shall be associated with a flight information centre or an area control centre for the provision of meteorological information. 16.2.4 Where, owing to local circumstances, it is convenient for the duties of an associated aerodrome meteorological office or meteorological watch office to be shared between two or more aerodrome meteorological offices or meteorological watch offices, the division of responsibility should be determined by MET service provider in consultation with the appropriate ATS provider. 16.2.5 Any meteorological information requested by an air traffic services unit in connection with an aircraft emergency shall be supplied as rapidly as possible. **16.3 Supply, dissemination and transmission arrangements** 16.3.1 Where necessary for flight information purposes, current meteorological reports and forecasts shall be supplied to designated aeronautical telecommunication stations. A copy of such information shall be forwarded, if required, to the FIC or ACC.	แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบทรวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้

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	16.3.2 When computer-processed upper-air grid point data in digital form is made available to air traffic services units for use by air traffic services computers the transmission arrangements should be as agreed between the meteorological service provider and the appropriate ATS provider. The data should be supplied as soon as is practicable after the processing of the forecasts has been completed.	
16.3 Information for search and rescue services units 16.3.1 An aerodrome meteorological offices or meteorological watch offices designated by MET service provider in accordance with Asia and Pacific Regions (APAC) Air Navigation Plan shall supply search and rescue services units with the meteorological information they require in a form established by agreement. For that purpose, the designated aerodrome meteorological office or meteorological watch office shall maintain liaison with the search and rescue services unit throughout a search and rescue operation.	**16.34 Information for search and rescue services units** 16.34.1 An aerodrome meteorological offices or meteorological watch offices ~~designated~~ arranged by MET service provider in accordance with Asia and Pacific Regions (APAC) Air Navigation Plan shall supply search and rescue services units with the meteorological information they require in a form established by agreement. For that purpose, the designated aerodrome meteorological office or meteorological watch office shall maintain liaison with the search and rescue services unit throughout a search and rescue operation. **16.5 List of information** 16.5.1 Information to be supplied to rescue coordination centres shall include the meteorological conditions that existed in the last known position of a missing aircraft and along the intended route of that aircraft with particular reference to: a) significant en-route weather phenomena; b) cloud amount and type, particularly cumulonimbus; height indications of bases and tops; c) visibility and phenomena reducing visibility; d) surface wind and upper wind; e) state of ground, in particular, any snow cover or flooding; f) sea-surface temperature, state of the sea, ice cover if any and ocean currents, if relevant to the search area; and sea-level pressure data.	แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบทรวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้

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16.4 Information for aeronautical information services units 16.4.1 MET service provider shall arrange for the supply of up-to-date meteorological information to relevant aeronautical information services units, as necessary, for the conduct of their functions.	**16.~~4~~6 Information for aeronautical information services units** 16.~~4~~6.1 MET service provider shall arrange for the supply of up-to-date meteorological information to relevant aeronautical information services units, as necessary, for the conduct of their functions. **16.7 List of information** 16.7.1 The following information shall be supplied, as necessary, to an aeronautical information services unit: a) information on meteorological service for international air navigation, intended for inclusion in the aeronautical information publication(s) concerned; *Note.— Details of this information are contained in the* Procedures for Air Navigation Services — Aeronautical Information Management *(PANS-AIM, Doc 10066), Appendix 3, Part 1, GEN 3.5 and Part 3, AD 2.2, 2.11, 3.2 and 3.11.* b) information necessary for the preparation of NOTAM or ASHTAM including, in particular, information on: 1) the establishment, withdrawal and significant changes in operation of aeronautical meteorological services. This information is required to be provided to the aeronautical information services unit sufficiently in advance of the effective date to permit issuance of NOTAM in compliance with Annex 15, 6.3.2.2 and 6.3.2.3; 2) the occurrence of volcanic activity; and *Note.— The specific information required is contained in Annex 3, Chapter 3, 3.3.2 h) and Chapter 4, 4.8.* 3) release of radioactive materials into the atmosphere, as agreed between the meteorological and appropriate civil aviation authorities concerned; and *Note.— The specific information required is contained in Annex 3, Chapter 3, 3.4.2 g).* c) information necessary for the preparation of aeronautical information circulars including, in particular, information on:	แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบทรวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้

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	1) expected important changes in aeronautical meteorological procedures, services and facilities provided; and 2) effect of certain weather phenomena on aircraft operations.	
Chapter 17 ~~Requirements for and~~ Use of Communications to Exchange Meteorological Information		
17.1 General 17.1.1 This chapter sets out the standards Requirements for and Use of Communications. 17.1.2 Technical specifications and detailed criteria related to Requirements for and Use of Communications are contained in ICAO Annex 3, Appendix 10.	**17.1 General** 17.1.1 This chapter sets out the standards ~~Requirements for and~~ Use of Communications to Exchange Meteorological Information. 17.1.2 ~~Technical specifications and detailed criteria~~ The Standards and Recommended Practices related to ~~Requirements for and~~ Use of Communications to Exchange Meteorological Information are contained in ~~ICAO Annex 3,~~ PANS-MET (Doc 10157), Chapter 10 ~~Appendix 10~~.	แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบท รวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้
17.2 Requirements for communications 17.2.1 Suitable telecommunications facilities shall be made available to permit aerodrome meteorological offices and, as necessary, aeronautical meteorological stations to supply the required meteorological information to air traffic services units on the aerodromes for which those offices and stations are responsible, and in particular to aerodrome control towers, approach control units and aeronautical telecommunications stations serving these aerodromes. 17.2.2 Suitable telecommunications facilities shall be made available to permit meteorological watch offices to supply the required meteorological information to air traffic services and search and rescue services units in respect of the flight information regions, control areas and search and rescue regions for which those offices are responsible, and in particular to flight information centres, area control centres and rescue coordination centres and the associated aeronautical telecommunications stations.	**17.2 Requirements for communications** 17.2.1 MET service provider shall arrange ~~S~~suitable telecommunications facilities ~~shall be made available to permit~~ for aerodrome meteorological offices and, as necessary, aeronautical meteorological stations in order to supply the required meteorological information to air traffic services units on the aerodromes for which those offices and stations are responsible, and in particular to aerodrome control towers, approach control units and aeronautical telecommunications stations serving these aerodromes. 17.2.2 MET service provider shall arrange ~~S~~suitable telecommunications facilities ~~shall be made available to permit~~ for meteorological watch offices to supply the required meteorological information in order to air traffic services and search and rescue services units in respect of the flight information regions, control areas and search and rescue regions for which those offices are responsible, and in particular to flight information centres, area control centres and rescue coordination centres and the associated aeronautical telecommunications stations. 17.2.3 MET service provider shall arrange ~~S~~suitable telecommunications facilities ~~shall be made available~~ to access world area forecast system	แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบท รวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้

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17.2.3 Suitable telecommunications facilities shall be made available to permit world area forecast centres to supply the required world area forecast system products to MET service provider.	forecasts ~~permit~~ from world area forecast centres ~~to supply the required world area forecast system products to MET service provider~~. 17.2.4 MET service provider shall arrange ~~T~~telecommunications facilities between aerodrome meteorological offices and, as necessary, aeronautical meteorological stations and aerodrome control towers or approach control units ~~shall~~ which are able to permit communications by direct speech, the speed with which the communications can be established being such that the required points may normally be contacted within approximately 15 seconds.	
17.2.4 Telecommunications facilities between aerodrome meteorological offices and, as necessary, aeronautical meteorological stations and aerodrome control towers or approach control units shall permit communications by direct speech, the speed with which the communications can be established being such that the required points may normally be contacted within approximately 15 seconds.		
17.2.5 Telecommunications facilities between aerodrome meteorological offices or meteorological watch offices and flight information centres, area control centres, rescue coordination centres and aeronautical telecommunications stations should permit: a) communications by direct speech, the speed with which the communications can be established being such that the required points may normally be contacted within approximately 15 seconds; and b) printed communications, when a record is required by the recipients: the message transit time should not exceed 5 minutes.	17.2.5 MET service provider should arrange ~~T~~telecommunications facilities between aerodrome meteorological offices or meteorological watch offices and flight information centres, area control centres, rescue coordination centres and aeronautical telecommunications stations ~~should~~ which are able to permit: a) communications by direct speech, the speed with which the communications can be established being such that the required points may normally be contacted within approximately 15 seconds; and b) printed communications, when a record is required by the recipients: the message transit time should not exceed 5 minutes.	
Note. — In subsection 17.2.4 and 17.2.5 "approximately 15 seconds" refers to telephony communications involving switchboard operation and "5 minutes" refers to printed communications involving retransmission.	*Note. — In subsection 17.2.4 and 17.2.5 "approximately 15 seconds" refers to telephony communications involving switchboard operation and "5 minutes" refers to printed communications involving retransmission.* 17.2.6 The telecommunications facilities required in accordance with subsection 17.2.4 and 17.2.5 should be supplemented, as and where necessary, by other forms of visual or audio communications, for example, closed-circuit television or separate information processing systems.	

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17.2.6 The telecommunications facilities required in accordance with subsection 17.2.4 and 17.2.5 should be supplemented, as and where necessary, by other forms of visual or audio communications, for example, closed-circuit television or separate information processing systems.	17.2.7 MET service provider should arrange an agreement with operators ~~As agreed between MET service provider and operators, provision should be made to enable operators~~ to establish suitable telecommunications facilities for obtaining meteorological information from aerodrome meteorological offices or other appropriate sources.	
17.2.7 As agreed between MET service provider and operators, provision should be made to enable operators to establish suitable telecommunications facilities for obtaining meteorological information from aerodrome meteorological offices or other appropriate sources.	17.2.8 MET servicer provider shall arrange ~~S~~suitable telecommunications facilities ~~shall be made available to permit meteorological offices~~ in order to exchange operational meteorological information with other meteorological offices.	
17.2.8 Suitable telecommunications facilities shall be made available to permit meteorological offices to exchange operational meteorological information with other meteorological offices.	17.2.9 MET service provider should arrange ~~The~~ telecommunications facilities used for the exchange of operational meteorological information which should be the aeronautical fixed service or, for the exchange of non-time critical operational meteorological information, the public internet, subject to availability, satisfactory operation a bilateral/multilateral and /or Asia/Pacific air navigation agreement. *Note 1. — Aeronautical fixed service Internet-based services, operated by the world area forecast centres, providing for global coverage are used to support the global exchanges of operational meteorological information.* *Note 2. — Guidance material on non-time-critical operational meteorological information and relevant aspects of the public Internet is provided in the Guidelines on the Use of the Public Internet for Aeronautical Applications (Doc 9855).*	
17.2.9 The telecommunications facilities used for the exchange of operational meteorological information should be the aeronautical fixed service or, for the exchange of non-time critical operational meteorological information, the public internet, subject to availability, satisfactory operation a bilateral/multilateral and /or Asia/Pacific air navigation agreement. *Note 1. — Aeronautical fixed service Internet-based services, operated by the world area forecast centres, providing for global coverage are used to support the global exchanges of operational meteorological information.* *Note 2. — Guidance material on non-time-critical operational meteorological information and relevant aspects of the public Internet is provided in the Guidelines on the Use of the Public Internet for Aeronautical Applications (Doc 9855).*	17.2.10 MET service provider should arrange a transmission arrangement with appropriate ATS provider when upper-air grid point data in digital form is made available for use by air traffic services computers. 17.2.11 MET service provider should arrange a transmission arrangement with operators concerned and WAFC concerned when upper-air	

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	grid point data in digital form is made available to operators for flight planning by computer.	
17.3 Use of aeronautical fixed service communications and the public Internet – meteorological bulletins 17.3.1 Meteorological bulletins containing operational meteorological information to be transmitted via the aeronautical fixed service or the public internet shall be originated by the appropriate meteorological office or aeronautical meteorological station. *Note. — Meteorological bulletins containing operational meteorological information authorized for transmission via the aeronautical fixed service are listed in ICAO Annex 10, Volume II, Chapter 4, together with the relevant priorities and priority indicators.*	**17.3 Use of aeronautical fixed service communications and the public Internet ~~– meteorological bulletins~~** **17.3.1 Meteorological bulletins** 17.3.1.1 Meteorological bulletins containing operational meteorological information to be transmitted via the aeronautical fixed service or the public internet shall be originated by the appropriate meteorological office or aeronautical meteorological station. *Note. — Meteorological bulletins containing operational meteorological information authorized for transmission via the aeronautical fixed service are listed in ICAO Annex 10, Volume II, Chapter 4, together with the relevant priorities and priority indicators.* 17.3.1.2 Messages and bulletins containing operational meteorological information shall achieve transit times of less than 5 minutes, unless otherwise determined to be lower by Asia/Pacific air navigation agreement.	แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบทรวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้
17.4 Use of aeronautical fixed service communications-world area forecast system products 17.4.1 World area forecast system products in digital form should be transmitted using binary data communications techniques. The method and channels used for the dissemination of the products should be as determined by Asia/Pacific air navigation agreement.	**17.4 ~~Use of aeronautical fixed service communications-w~~ World area forecast system ~~products~~ forecasts** 17.4.1 The telecommunications facilities used for the supply of WAFS forecasts should be the aeronautical fixed service or the public Internet. 17.4.~~1~~2 ~~World area forecast system~~ WAFS ~~products in digital form~~ forecasts should be transmitted using ~~binary~~ digital data communications techniques. The method and channels used for the dissemination of the ~~products~~ forecasts should be as determined by Asia/Pacific air navigation agreement.	แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบทรวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้
17.6 Use of aeronautical data link service–contents of D-VOLMET	**17.6 Use of aeronautical data link service–~~contents of~~ D-VOLMET**	แก้ไขเพิ่มเติมให้มีความเหมาะสมและสอดคล้องกับสภาพบริบทรวมทั้งเพื่อความชัดเจนในการตีความและการบังคับใช้
17.7 Use of aeronautical broadcasting service-contents of VOLMET broadcasts	**17.7 Use of aeronautical broadcasting service-~~contents of~~ VOLMET broadcasts**	