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THE TANZANIA METEOROLOGICAL AUTHORITY ACT,
(CAP. 157)

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REGULATIONS

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(Made under section 54(2)(a))

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THE TANZANIA METEOROLOGICAL AUTHORITY (WEATHER AND CLIMATE FORECASTING ACTIVITIES) REGULATIONS 2021

ARRANGEMENT OF REGULATIONS

THE TANZANIA METEOROLOGICAL AUTHORITY ACT,
(CAP. 157)

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REGULATIONS

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(Made under section 54(2)(a))

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THE TANZANIA METEOROLOGICAL AUTHORITY (WEATHER AND CLIMATE FORECASTING ACTIVITIES) REGULATIONS 2021

PART I
PRELIMINARY PROVISIONS

Citation

1. These Regulations may be cited as the Tanzania Meteorological Authority (Weather and Climate Forecasting Activities) Regulations, 2021.

Application

2. These Regulations shall apply to weather and climatic forecasting activities.

Interpretation

3. In these Regulations, unless the context requires otherwise-

Cap. 157

"Act" means the Tanzania Meteorological Authority Act;

"Authority" means the Tanzania Meteorological Authority established under section 4;

"consumer" means any person who is regulated and uses meteorological services issued or provided by the Authority;

"special purpose permit" means a permit other than permit of meteorological observations, weather forecasting activities or weather modification activities; and

"weather and climate forecasting" means the general terminology for weather forecast, climate prediction and specialized meteorological forecasts.

PART II
REQUIREMENT TO APPLY FOR ENGAGEMENT IN FORECASTING ACTIVITIES

Application for provision of meteorological activities

4.-(1) A person who intends to engage in any meteorological activity shall apply for a permit to the Authority.

(2) The particulars of the application under subregulation (1) shall be in the form set out under the First Schedule to these Regulations.

(3) The meteorological activities referred to under subregulation (1) include weather and climate forecasting activities or weather modification activities.

Conditions for issuance of permit

5. The Authority may issue a permit to a person who fulfils the following conditions-

(a) own a company dully registered;
(b) pay all charges, costs and fees as may be determined;
(c) has complied with the requirements of the laws;
(d) has an established office premises
(e) has capacity to carry out activities;
(f) has no criminal records;
(g) has complied with guidelines, directions and orders issued by the Authority.

Fees

6.-(1) Subject to section 16 of the Act, the permit granted shall be subject to payment of a fee prescribed in the Second Schedule to these Regulations.

(2) Notwithstanding subregulation (1), a special purpose permit may be issued upon payment of a fee prescribed in the Second Schedule to these Regulations.

(3) The permit granted under the Act shall be subject to payment of-

(a) application fee;
(b) permit fee; and
(c) any other fees or charges as may be prescribed by the Director General after consultation with the Board.

Terms and conditions of permits

7. The terms and conditions of a permit issued under the Act shall be appended at the back of the permit.

Loss, damage or alter of permit

8.-(1) The Director General may, where he is satisfied with the evidence of the permit holder that his permit has been lost, destroyed or defaced, and upon payment of a fee of thirty percent of the value of the permit, issue a duplicate permit.

(2) A person shall not be allowed to temper or alter a permit in any circumstances.

(3) A person who contravenes the provisions of subregulation (2) commits an offence.

Suspension and cancellation of permit

9.-(1) The Director General may suspend or cancel a permit for any of the following reasons-

(a) the holder had provided false, misleading or incomplete information in the application;

(b) the holder has contravened the terms and conditions specified in the permit;

(c) there has been a change in material or circumstances affecting the eligibility criteria required for issuance of permit;

(d) failure to submit required reports; and

(e) for such other reasons as may be prescribed by the Director General subject to the laws.

(2) Where a permit holder contravenes the provisions of subregulation (1), the Director General shall, within seven days, require the holder in writing, to show cause why the permit should not be suspended or cancelled.

(3) The Director General shall, after the expiry of the period referred to in subregulation (2) proceeds to suspend or cancel the permit as the case may be.

(4) The Director General shall, where he decides to cancel the permit, notify the holder in writing with reasons.

Reports keeping

10.-(1) The Director General shall keep the reports and other information relating to the permits issue under the Act.

(2) The records under subregulation (1) may be

inspected by any person upon payment of fee prescribed in the Second Schedule to these Regulations.

PART III
ISSUANCE OF PUBLIC WEATHER AND CLIMATE FORECASTS AND WARNINGS

Provision of weather forecasts and warnings

11.-(1) The Authority shall issue to the public-

(a) weather and climate forecasts services and weather related warnings;

(b) accurate and timely weather forecast and weather warning; and

(c) information of tropical cyclones in a timely way, when it moved into the area of latitude 5 − 25 degrees South, and longitude 45 − 60 degrees East.

(2) Without prejudice to subregulation (1) the Authority shall, on request, issue weather warning information to any person for hazard mitigation purpose.

Dissemination of forecasts and warnings

12.-(1) The Authority shall issue forecast and warning to the media including radio, television and newspaper for dissemination to the public.

(2) The media shall disseminate to the public-

(a) regular weather and climate forecasts; and

(b) the latest weather warning immediately after a warning has been issued by the Authority.

Duty to inform Authority

13.-(1) A person who observes a weather event which may affect the locality may, immediately through any available means, inform the Authority.

(2) The Authority shall, upon receipt of information on the occurrence of weather event, analyse such information and provide advice.

Weather modification

14.-(1) Subject to section 15 of the Act, a person who intends to modify weather shall be required to make an application for a permit from the Authority in a form set out under the First Schedule to these Regulations.

(2) Subject to subregulation (1), the Authority

may, within thirty days from the date of receipt of an application, approve and issue a permit or refuse a permit.

(3) The Authority shall, upon approval and issuance of permit-

(a) provide guidance and meteorological services for the experiments and operation; and

(b) monitor the work of the applicant.

(4) Where the application under subregulation (1) is refused the Authority shall, within thirty days from the date of receipt of an application, inform the applicant and give the reason of such refusal.

Performance award

15.-(1) A person practicing or designating meteorological services may submit to the Authority his work together with associated documents for award consideration.

(2) The Authority may, upon receipt of submission under subregulation (1), consider such submission.

(3) The Authority shall, when considering the award, base on the following criteria-

(a) promoting meteorological service;

(b) advancing research and development in meteorological related technology; and

(c) engaged in meteorological-related disaster mitigation education.

(4) The Authority shall, annually, give award to the best practicing or disseminating performer for promoting meteorological services.

(5) When considering the award, the Authority shall base on the following criteria-

(a) promoting meteorological service;

(b) advancing research and development in meteorological related technology; and

(c) engaged in meteorological-related disaster mitigation education.

PART IV
QUALIFICATION OF FORECASTERS

Education of forecasters

16.-(1) A person who intends to deal with provision

of weather forecast or warning shall be required to be a holder of a degree in meteorology from the recognized university.

(2) A person who contravenes this regulation commits an offence.

Competency of weather forecasters

17.-(1) The Authority shall, before permitting a person to engage in weather forecasts or warnings, ensure that such person complies with relevant competence standards prescribed under the Third Schedule to these Regulations.

(2) The Authority shall issue a certificate to a competent weather forecaster and maintain records as evidence of conformity.

Register for public weather forecasters

18. The Authority shall keep and maintain a register of qualified public weather forecasters.

PART V
CONSUMERS OF METEOROLOGICAL SERVICES OR PRODUCTS

Provision of meteorological services or products

19.-(1) A consumer who is requesting a service provided by the Authority shall specify a type of service required.

(2) The Authority may, upon receipt of a request under subregulation (1), provide meteorological services or products.

(3) The Authority shall, subject to the nature of the service requested provide meteorological services or products in a manner agreed by both parties.

(4) Where the required meteorological services or products are provided by a third party the Authority shall coordinate the availability of such services and products from the reliable and authentic sources.

(5) The services requested may be commercial tailor-made services and product arrangements, including rates, terms and conditions for all services offered to the public.

Protection of consumer information

20. Where a consumer is requested to produce any information to the Authority, such information shall not be disclosed to a third party unless authorized in writing by a consumer.

Training to consumers

21.-(1) The Authority may, upon request by a customer, provide specialised training on meteorological services.

(2) The training shall be provided subject to the payment of fees or charges as prescribed in the Second Schedule.

Consumer Consultative forums

22. The Authority may, at least once in every two years, conduct consumer consultative forum on meteorological services and products to discuss, share experience and challenges.

Types of consumers

23. For the purposes of these Regulations consumers of meteorological services or products includes general public, specific sectors and individuals.

PART VI
OFFENCES AND PENALTIES

General penalty

24. A person who contravenes the provisions of these Regulations which no specific penalty has been provided for under the Act, commits an offence and shall, upon conviction, be liable to a fine of not less than one million shillings but not exceeding three million shillings or to imprisonment for a term of not less than six months but not exceeding twelve months or to both.

SCHEDULES

FIRST SCHEDULE

(Made under regulation 4(2) and 14(1))

PERMIT APPLICATION FORM

A. PERMIT FOR WEATHER AND CLIMATE FORECASTING

1. Particulars of the Applicant			
Name of the Applicant	.....		
Location (City/Town)	.....		
Postal address	.....	Postal Code	.....
Physical Address	.....	E-mail Address	.....
Telephone No.	.....	Fax	.....
Nationality	.....		
Business	.....		
Business Tin number/Registration certificate number		.....	
Does the Applicant have qualified personnel in Meteorology? YES ☐ / **NO** ☐		If yes, please specify (attach evidence):	

2. Information regarding the requested meteorological activity

(a) Category of Meteorological Activity to be undertaken (Check/tick the appropriate)
   i. Weather observation ☐
   ii. Weather Forecasting ☐

(b) For Weather observation activities, select the type of meteorological stations networks involved:

(i)	Synoptic stations	☐
(ii)	Aircraft meteorological stations	☐
(iii)	Automatic weather stations	☐
(iv)	Radar wind profiler stations	☐
(v)	Weather radar stations	☐
(vi)	Aeronautical meteorological stations	☐
(vii)	Research or Training-purpose stations	☐
(viii)	Climatological stations	☐
(ix)	Agricultural meteorological stations	☐
(x)	Rainfall meteorological stations	☐
(xi)	Hydrological meteorological stations	☐
(xii)	Global Climate Observing System (GCOS)	☐
(xiii)	Special meteorological stations	☐
(xiv)	Other	☐

In case of (xiii) or (xiv) please specify
.....
.....,
.....
.....

(c) Are the stations networks already established? YES ☐ / NO ☐
If yes, please mention them:

1. .....,
2. .....,
3. .....,
4. .....,
5. .....

(d) Purpose of engagement in the meteorological activity (ies):
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

(e) Place of meteorological activity
i. Location name (Region) of a meteorological station:..……..…….……
ii. District ……...…….……
iii. Ward ……..……..…
iv. Station name:..…….……
v. Latitude:. ……
vi. Longitude: ……...….
vii. Altitude……...…….....

3. Declaration

I....., the applicant of the permit hereby declare that all the information contained in this form is in accordance with facts and truth to the best of my knowledge. In this regard, I have carefully read and understood the details of this form and therefore agree to abide with the terms and conditions as appropriate.

Applicant's signature..... Date.....

4. FOR OFFICIAL USE ONLY.

The application for permit is recommended for approval on the following conditions:

1. The meteorological activity to be performed under this permit is:

   ……

2. For weather observations, the type of meteorological stations networks recommended under this permit includes:

   a. .....,
   b. .....,
   c. .....,
   d. .....,
   e. .....,
   f. ……...

_____

_____

Name of Reviewing Officer (1) Signature

_____

_____

Name of Reviewing Officer (2) Signature

Notice to the Applicant:

1. Dully filled application form to be accompanied by an introduction letter from the applicant's hamlet, street or village leaders, or institution.
2. Payments to be done to the Authority.
3. For Weather observation activities, the applicant shall have dedicated personnel with minimum qualification of at least Certificate in Meteorology (from the recognized institution).
4. For Weather forecasting activities, the applicant shall have dedicated personnel with minimum qualification of at least B.Sc. in Meteorology (from the recognized institution).
5. Qualification evidences referred to in part c and/or d to be attached to this application.

B. PERMIT APPLICATION FOR WEATHER MODIFICATION

1. Particulars of the Applicant

Name of the Applicant	....		
Location (City/Town)	....		
Postal address	....	Postal Code	....
Physical Address	....	E-mail Address	....
Telephone No.	....	Fax	....
Nationality	....		
Business	....		
Business Tin number/Registration certificate number		....	

2. Information regarding the requested meteorological activity

(a) Purpose for conducting the weather modification activity?
.....
.....
.....
.....
.....
.....

(b) Describe the location of the proposed targeted area *(include county boundaries, regions/districts, latitudes, longitudes, geographic features, and map of the targeted area)*:

(i) Location name: …….……
(ii) Station name: ……..
(iii) Latitude:
……..……
(iv) Longitude:
…….
(v) Altitude……
……...

(information on geographical features of the area or nearby):
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

(c) Dates for the operation

Starting: ……./……./……	Ending: ……../……../……
Frequency of operation of the activity	

(d) Are the proposed operations to be conducted under contract?	Yes ☐	No ☐

(e) If Yes	(i)	provide the name(s) of the person(s) to conduct the operation: Name:..... Name:..... Document attachment?: Yes ☐ No ☐
	(ii)	Provide evidence that he/she is capable or qualified and experience in performing weather modification activities *(attach documents)* ....
(f) If No	(i)	provide the name(s) of the person(s) with evidence of their qualification that they can carry out weather modification activities *(attach documents)* - Name:..... Name:..... Document attachment?: Yes ☐ No ☐

Attach a complete and detailed description of the project operational plan, which includes the types of seeding agents to be used, the methods and equipment to be employed in seeding operations, and the emergency shutdown procedures, including the conditions under which operations will be suspended:
.....
.....
.....

3. Declaration

I....., the applicant of the permit hereby declare that all the information contained in this form and all attachments are in accordance with facts and truth to the best of my knowledge.

Name	Title	Signature	Date

SECOND SCHEDULE

(Made under regulations 6(1) and (2), 10(2) and 22(2))

Fees and Charges for Permit of Meteorological Activities

1. To conduct weather observation (to operate meteorological station)				
Type of Station/Activity	Class of Observing Station	Application Fee (TZS)	Permit Fee (TZS)	Annual Renewal License Fee (TZS)
Class A: Rainfall Station				
Rainfall Station	Manned	5,000	20,000	Nil
	Automatic	10,000	300,000	200,000
Class B: Manned/ Conventional Stations				
Surface Synoptic Station	Land Station	50,000	800,000	300,000
Aeronautical meteorological station	Manned			
Agricultural Meteorological Station	Manned			
Climatological Station				
Hydro-meteorological stations				
Training purpose				
Research-purpose station				
Training-purpose station				
Special-purpose station				

Class C: AWS Stations				
Automatic Weather Station (AWS)	AWS	300,000	500,000	300,000
Automatic Weather Observing System (AWOS)	AWOS			
Surface Synoptic Station				
Class D: Radar and Special Stations				
Upper-air Synoptic Station	Radiosonde	2,000,000	5,000,000	1,000,000
Weather RADAR Station	S-band			
	C-band			
	X-band			
RADAR Wind Profiler Station				
Aircraft Meteorological Station				
Special meteorological stations	Radiation station			
	Lightning location station			
	Tide-gauge station			
	Other remote-sensing profiler stations			
	Meteorological reconnaissance aircraft station			
	Global Atmosphere Watch (GAW) station			
	Planetary boundary-layer station			
2. To conduct Weather and climatic forecast				
Permit for forecasting activities		2,000,000	5,000,000	3,000,000
3. To conduct weather modification activity				

Weather modification		5,000,000	10,000.000	-
CLASS E. Training Fees				
Short Courses at National Meteorological Training Centre, Kigoma	Per person	1,000,000		
Short Course at other locations	Per person for three days	1,200,000		
	Per person for Five days	1,500,000		

THIRD SCHEDULE

(Made under regulation 17(1))

Competence Standards for Public Weather Forecasters

Competence Assessment Areas

Provided hereunder is what is considered as necessary or areas of emphasis for a Meteorological Personnel working as a public weather forecaster:

1.0. Chart analysis:

1.1. How to analyze weather charts and techniques to be used, including:
- smoothing of contours;
- pressure gradients towards High/Low pressure systems;
- Geopotential heights especially over the Southern Africa region.

1.2. Identification of synoptic features/systems and associated impacts of-
- weather in Tanzania like ITCZ (Zonal and Meridional arms);
- High pressure systems (Mascarine, St Helena, Azores and Siberian);
- East African ridge, Arabian ridge;
- Troughs;
- frontals systems;
- Tropical Cyclones (If any).

1.3. Locating weather feature on weather chart, including:
- ITCZ;

- High-pressure systems;
- East African ridge;
- troughs, fronts systems;
- tropical Cyclones.

2.0. Marine forecast

2.1. How to develop marine weather forecast for the coastal areas and over Lakes;

2.2. Introduce the concept of-

- Swell;
- wind wave;
- total sea;
- wave period;
- wave height;
- Tsunami.

2.3. Warning and Advisory issuing criteria for-

- strong wind;
- heavy rain falls; and
- large waves.

3.0. General weather and climatic forecast

3.1. Introduction to different NWP and climate models available, including:

3.2. Understanding General Atmospheric Circulation patterns;

3.3. Interpretation of different weather parameters like-

- streamline (wind);
- Moisture (RH);
- Precipitable water;
- Vertical velocity;
- Wind Shear;
- Convergence and Divergence.

3.4. Satellite Imagery (VIS, WV and IR) interpretations;

3.5. Tephigram- practice to draw (if there is any previous ascent data) and interpretation;

3.6. Instability Indices interpretation-

- Showalter Index; and
- K Index.

3.7. Ensemble or Deterministic forecasts and interpretation.

4.0. Nowcasting, severe weather and medium range forecasting

4.1. Developing customer tailored forecasts with time leads of hours to three days;

4.2. Understanding Model uncertainties in medium range forecasting and how to incorporate them in the forecast;

4.3. Understanding how to identify cloud types and their associated weather activities;

4.4. Development of Impact based forecast.

5.0. Aviation forecasting

5.1. Developing Sigwx weather chart for-

- 100 FLs; and
- 180 FLs.

5.2. Introducing significant weather phenomena and symbols on chart, including:

- Precipitation;
- Thunderstorms;
- Clouds;
- Turbulence;
- Icing;
- Volcano.

5.3. Developing Sigwx from synergy by using available tools.

5.4. Understanding of weather Codes, Symbols and their interpretation and presentation.

5.5. Use of AerometWeb and MAIS in prevision of Aeronautical forecasts and warnings.

6.0. Other duties, including:

6.1. Preparation of Power Point Presentations for weather conference;

6.2. Editing and dissemination of weather products to end-users;

6.3. Adequate awareness and understanding of forecasting process as per QMS standards;

6.4. Uploading weather products on the TMA website;

6.5. Participate fully in weather discussions during Weather Conferences at CFO;

6.6. Use of Synergy system in Analysis and visualization;

6.7. Understanding the Service Delivery Strategy and competency requirement for Forecasters, Presenters and Advisors including:

- Weather and climate services or products issued;
- Dissemination and communication tools.

Dodoma,
23th June, 2021

LEONARD M. CHAMURIHO
Minister for Works and Transport

GOVERNMENT NOTICE No. 595 Published On. 16/7/2021

THE TANZANIA METEOROLOGICAL AUTHORITY ACT,
(CAP. 157)

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REGULATIONS

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(Made under section 54)

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THE TANZANIA METEOROLOGICAL AUTHORITY (METEOROLOGICAL STATIONS) REGULATIONS, 2021

ARRANGEMENT OF REGULATIONS

Regulation *Title*

PART III
TYPES OF METEOROLOGICAL STATIONS
(a) Synoptic Stations

THE TANZANIA METEOROLOGICAL AUTHORITY ACT,
(CAP. 157)

———

REGULATIONS

———

(Made under section 54)

———

THE TANZANIA METEOROLOGICAL AUTHORITY (METEOROLOGICAL STATIONS) REGULATIONS, 2021

PART I
PRELIMINARY PROVISIONS

Citation

1. These Regulations may be cited as the Tanzania Meteorological Authority (Meteorological Stations) Regulations, 2021.

Application

2. These Regulations shall apply to the provision for establishment, operation, maintenance and coordination of meteorological stations.

Interpretation

3. In these Regulations, unless the context requires otherwise-

"aeronautical meteorological station" means a station designated to make observations and meteorological reports for use in air navigation;

"aircraft" means an airplane, helicopter or airship used to make environmental observations;

"aircraft meteorological station" means meteorological station situated on an aircraft;

"Aircraft Meteorological Data Relay" means the collective name for the automated aviation meteorological data collection systems from aircraft fitted with appropriate software packages;

"aircraft observation" means the evaluation of one or more meteorological elements made from an aircraft in flight;

"air-report" means a report from an aircraft in flight

prepared in conformity with requirements for position, and operational or meteorological reporting;

"agricultural meteorological station" means a place where agro-meteorological observations are made;

"climatological station" means a station whose observations are used for climatological purposes;

"fixed sea station" means an ocean weather ship or a station situated on a lightship, a fixed or anchored platform, a small island or in certain coastal areas;

"forecast" means a statement of expected meteorological conditions for a specified time or period, and for a specified area or portion of airspace;

"hydrological observation" means the direct measurement or evaluation of one or more hydrological elements, such as stage, discharge, water temperature, etc.;

"hydrological meteorological or observing station" means a place where hydrological observations or climatological observations for hydrological purposes are made.

"land station" means an observing station or field site situated on land, either fixed or mobile;

"meteorological information" means a meteorological report, analysis, forecast, and any other statement relating to existing or expected meteorological conditions;

"meteorological observations" means evaluation of one or more meteorological elements;

"meteorological report" means a statement of observed meteorological conditions related to a specified time and location;

"meteorological stations" means facilities, either fixed or mobile on land, sea or space with instruments to measure atmospheric conditions;

"meteorological watch office" means an office designated to provide information 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 within its specified area of responsibility;

"mobile sea station" means a station aboard a mobile ship or an ice floe;

"ocean weather station" means a station aboard a suitably equipped and staffed ship that shall remain at a fixed sea position and that makes and reports surface and upper air observations, and may also make and report subsurface observations;

"ordinary climatological station" means a climatological station at which observations are made at least once daily, including daily readings of extreme temperature and of amount of precipitation;

"principal climatological station" means a climatological station at which hourly readings are taken, or at which observations are made at least three times daily in addition to hourly tabulation from autographic records;

"rainfall station" means a station at which observations of rainfall are made;

"sea station" means an observing station situated at sea and shall include ships, ocean weather stations and stations on fixed or drifting platforms rigs, platforms, lightships, buoys and ice floes;

"surface observation" means a meteorological observation, other than an upper-air observation, made from the Earth's surface;

"surface station" means a surface location from which surface observations are made;

"synoptic observation" means a surface or upper-air observation made at a standard time;

"synoptic station" means a station at which synoptic observations are made; and

"tide-gauge station" a station at which tidal measurements are made.

PART II
ESTABLISHMENT OF METEOROLOGICAL STATIONS

Obligation to comply with requirements

4.-(1) A person who intends to establish a meteorological station shall ensure that the type of station complies with the requirements under these Regulations.

(2) Subject to subregulation (1), the types of meteorological stations which may be established include-

(a) synoptic stations;
(b) aircraft meteorological stations;
(c) automatic weather stations;
(d) radar wind profiler stations;
(e) weather radar stations;
(f) aeronautical meteorological stations;
(g) research or training-purpose stations;
(h) climatological stations;
(i) agricultural meteorological stations;
(j) rainfall meteorological stations;
(k) hydrological meteorological stations;
(l) Global Climate Observing System (GCOS);
(m) special meteorological stations; and
(n) any other type as the Authority may approve.

Registration of meteorological station

5.-(1) A person who intends to register a meteorological station shall be required to make application for registration to the Authority.

(2) An application under subregulation (1), shall be made in form No. 1 set out in the First Schedule to these Regulations accompanied with fee of such amount as prescribed in the Second Schedule to these Regulations.

(3) The Authority shall, upon receipt of an application, scrutinize and consider the application.

(4) The Authority shall, upon being satisfied with the application, register the station.

(5) Where the application is rejected, the Authority shall notify the applicant in writing and give the reasons of such rejection.

General requirements

6.-(1) The meteorological station operator shall ensure that, before establishing a meteorological station at a proposed location, a technical survey is conducted.

(2) Subject to the provisions of these Regulations, an applicant for registration of a meteorological station shall be required to comply with the following general requirements-

(a) the siting and exposure;

(b) personnel competence required;
(c) properly calibrated instruments;
(d) necessary instruments and technology used for observation of weather parameters; and
(e) preventive and corrective maintenance.

(3) Subject to subregulation (2), the Director General may suspend or cancel registration of a meteorological station where the requirements are not met and shall notify the owner in writing and give the reasons of such cancellation or suspension.

Supervision of meteorological operators

7. The meteorological station operator shall, for the purpose of facilitating monitoring and supervision by the Authority, be ready for-
(a) inspection visits; and
(b) submission of reports.

Requirement for application of permit

8.-(1) A person who intends to engage in operation of meteorological stations shall apply to the Authority for a permit in form No. 2 set out in the First Schedule to these Regulations.

(2) The permit granted under the Act shall be subject to payment of a fee prescribed in the Second Schedule to these Regulations.

Terms and conditions of permits

9. The Authority may issue a permit to a person who fulfils the following conditions-
(a) registered, in case of a company;
(b) pay all charges, costs and fees as may be determined;
(c) has capacity to carry out activities;
(d) has no criminal records; and
(e) has complied with guidelines, directives and orders issued by the Authority.

Loss, damage or alter of permit

10.-(1) Where the permit holder satisfies the Authority that the permit has been lost, destroyed or defaced, the Authority may, on payment of a fee of thirty percent of the value of the permit, issue a duplicate permit.

(2) A person shall not be allowed to alter a permit

in any circumstances.

(3) A person who contravenes the provisions of subregulation (2) commits an offence.

Suspension and cancellation of permit

11. The Director General may suspend or cancel a permit for any of the following reasons-

(a) the holder has provided false, misleading or incomplete information in the application;

(b) the holder has contravened the terms and conditions specified in the permit;

(c) there has been a change in material or circumstances affecting the eligibility criteria required for issuance of permit;

(d) failure to submit required reports; or

(e) such other reasons as may be prescribed by the Director General subject to the laws.

Reports keeping

12.-(1) The Director General shall keep the reports and other information relating to the permits issue under the Act.

(2) The records under subregulation (1) may be inspected by any person upon payment of a fee prescribed in the Second Schedule to these Regulations.

Inspection of meteorological stations

13.-(1) The meteorological operator shall cause to be carried out the inspection and maintenance to ensure a high standard of observations and correct functioning of instruments.

(2) The inspections and maintenance under subregulation (1) shall be carried out by technical personnel, who shall ensure that-

(a) the sitting and exposure of instruments are known, recorded and acceptable;

(b) instruments have approved characteristics, are in good order and regularly verified against relevant standards;

(c) there is uniformity in the methods of observation and in the procedure for reduction of observations;

(d) the observers are competent to carry out their duties.

(3) The inspection frequency shall depend on the type station, and shall be carried out according to inspection timeframe.

Networks for observing stations

14.-(1) Where a meteorological station operator establishes a station, the station shall be recognised as part of the national networks of observing stations.

(2) A meteorological station operator shall ensure that a station meets the requirements of the horizontal spacing of observing stations in a network.

(3) For the purpose of this regulation, "horizontal spacing" means an optimal distance between one station to another depending on the geographical features of the specific area.

Report of meteorological activities

15. The meteorological station operator shall be required to prepare an annual report of meteorological activities carried out in the station containing the following information-

(a) general condition of the station;
(b) maintenance;
(c) calibration status;
(d) training of staff;
(e) challenges;
(f) recommendation; and
(g) any other information.

PART III
TYPES OF METEOROLOGICAL STATIONS
(a) Synoptic Stations

Surface synoptic stations

16.-(1) The surface synoptic stations established shall-

(a) be either manned, partly or fully automated; and
(b) include land stations and fixed and mobile sea stations that conduct synoptic observations.

(2) The synoptic station shall be located to give

meteorological data representative of the area in which it is situated.

(3) The standard times of observations for surface synoptic stations shall be-

(a) main standard times of observations - 0000, 0600, 1200 and 1800 UTC; and

(b) intermediate standard times observations - 0300, 0900, 1500 and 2100 UTC.

(4) The atmospheric pressure observations at the synoptic station shall be made at exactly the standard time as prescribed under subregulation (3) while the observation of other meteorological elements shall be made within ten minutes preceding the standard time.

(5) In the cause of observation, the surface synoptic observations shall be made-

(a) four times daily at the main standard times, with priority being given to the 0000 and 1200 UTC observations, which are required for global exchanges; and

(b) twenty four times daily at main standard times, intermediate standard times and at regular hourly intervals for national use and exchange.

(i) Surface Land Synoptic Station

General requirements

17.-(1) Each synoptic station on land established shall be uniquely identified by a station index number which shall be issued by the Authority.

(2) Where it is necessary to change the index number of a synoptic land station, the change shall be made effective on 1st January or 1st July of a calendar year.

Siting and exposure requirements

18.-(1) The meteorological station operator shall ensure that a station is sited at a location with the following characteristic-

(a) ground covered with short grass or a surface representative of the locality, and surrounded by open fencing or palings to exclude unauthorized persons; and

(b) the site shall be away from trees, buildings,

walls or other obstructions.

(2) The instrument enclosure for a surface land synoptic station shall be of the size of 18m by 12m equal to 60ft x 40ft.

(3) The enclosure under subregulation (2) shall be sited in the middle of a buffer zone and aligned in the true North – South direction.

(4) The buffer area around the instrument enclosure shall be-

(a) at least 30m x 30m equal to 98.5ft x 98.5ft; and

(b) covered by the natural vegetation or ground cover of the region which shall be maintained below approximately 0.05m equal to 1.5 ft.

(5) The surface land synoptic stations shall be placed at intervals not exceeding the minimum horizontal resolution required as described by the Authority.

Composition requirements

19.-(1) The surface synoptic observations recorded at a manned synoptic land station shall consist of observations of the meteorological elements including-

(a) present weather;
(b) past weather;
(c) wind direction and speed;
(d) cloud amount;
(e) type of cloud;
(f) height of cloud base;
(g) visibility;
(h) air temperature;
(i) humidity;
(j) atmospheric pressure;
(k) pressure tendency;
(l) extreme temperature;
(m) amount of precipitation; and
(n) sunshine duration.

(2) The surface synoptic observations at an automatic land station shall consist of measurements of the meteorological elements including-

(a) atmospheric pressure;
(b) wind direction and speed;
(c) air temperature;

(d) humidity;
(e) precipitation;
(f) amount of precipitation; and
(g) intensity of precipitation.

Frequency and timing of observations

20. A meteorological station operator of the surface synoptic station shall be required to make observations and report-

(a) twenty four times daily at main standard times, intermediate standard times and at regular hourly intervals for national use and exchange; and
(b) less than twenty four times daily for selected stations with specific requirements.

(ii) Surface Sea Synoptic Stations

General requirements

21.-(1) The meteorological station operator of a mobile ship station shall be required to make observation on any event in a sea area and report to the Authority.

(2) The meteorological station operator shall, in case of mobile ship stations traverse data sparse areas and regularly follow routes through areas of particular interest to the ship owner, conduct observations and report to the Authority.

(3) The meteorological station operator of a fixed sea weather station shall obliged to make observation according to synoptic station requirement and report to the Authority.

Location characteristics for surface sea synoptic station

22. The meteorological station operator shall ensure that surface sea synoptic station is sited at a location with the following characteristics-

(a) a surface representative of the locality, and surrounded by open sea area; and
(b) be away from obstructions.

Composition for surface sea synoptic station

23.-(1) The meteorological station operator of surface sea synoptic station shall be required to make observation on the following elements-

(a) present weather;
(b) past weather;
(c) wind direction and speed;
(d) cloud amount;
(e) type of cloud;
(f) height of cloud base;
(g) visibility;
(h) air temperature;
(i) humidity;
(j) atmospheric pressure;
(k) pressure tendency;
(l) characteristic of pressure tendency;
(m) ship's course and speed;
(n) sea-surface temperature;
(o) direction of movement of waves;
(p) wave period;
(q) wave height; and
(r) special phenomena.

(2) Subject to subregulation (1), mobile ship stations shall make observation depending on the type of station as may be determined by the Authority based on national and international standards.

Frequency and timing of observations

24.-(1) The meteorological station operator of a surface sea synoptic station shall ensure that observations are made and reported at least four times per day at the main standard time.

(2) The meteorological station operator of a surface sea synoptic station shall ensure that observations at lightship stations, fixed and anchored platform stations and automatic sea stations are made and reported at least four times per day at the main standard times.

(3) Subject to subregulation (1), where there are operational difficulties on board ship to make observation impracticable at a main standard time, the actual time of observation shall be as near as possible to the main standard time.

(4) Subject to subregulation (1), where storm conditions prevail, surface synoptic observations shall be made and reported from mobile sea stations frequently

than at the main standard times.

(5) The meteorological operator of a surface sea synoptic station shall, when sudden and dangerous weather developments is encountered, make surface observations and report without regard to the standard observation times.

(iii) Upper-Air Synoptic Stations

General requirements

25.-(1) The meteorological station operator shall ensure that the upper-air synoptic stations are uniquely identified by a station identifier issued by the Authority.

(2) The meteorological station operator shall ensure that each upper-air station shall have an appropriate manual of instructions.

(3) The meteorological station operator may, in the cause of operation, when upper-air data from the ocean areas are sparse, give consideration to equipping suitable ships to make soundings and, if possible, to measure upper winds.

(4) The meteorological station operator shall ensure that upper-air station intended to observe pressure, temperature, humidity or wind is spaced at intervals not exceeding the minimum horizontal resolution.

Siting and exposure

26.-(1) The meteorological station operator shall ensure that the upper-air synoptic station is sited-

(a) on high ground, with the horizon being free from obstructions; and

(b) at an area with no obstructions subtending an angle exceeding 6° at the observation point.

(2) The stations sited under this regulation shall be spaced at intervals not exceeding the minimum horizontal resolution required as described by the Authority.

Meteorological elements

27. The upper-air synoptic observation shall consist of measurement of one or more of the following meteorological elements-

(a) atmospheric pressure;

(b) air temperature;

(c) humidity; or

(d) wind direction and speed.

Frequency and timing

28.-(1) The meteorological station operator shall, when making upper air synoptic observations, comply with the standard times.

(2) Subject to subregulation (1), the standard times of observation shall be at 0000, 0600, 1200 and 1800 UTC.

(3) Where the meteorological station operator encountered any difficult and fails to comply with standard times reffered under subregulation (2), he shall make observation and report at least at 0000 or 1200 UTC.

(4) The meteorological station operator at the upper-air synoptic shall ensure that observations at ocean weather stations, comprises of raw insonde observations at 0000 and 1200 UTC or radiowind observations at 0600 and 1800 UTC.

(5) The meteorological station operator shall, when making observation, ensure that the actual time of regular upper-air synoptic observations is as close as possible to H-30 and shall not fall outside the time range from H-45 to H.

(b) Climatological Stations

General requirements

29.-(1) A climatological station operator shall ensure that a climatological station give a satisfactory representation of the climate characteristics of all types of terrain in the territory.

(2) The climatological station operator shall establish and maintain a directory of a climatological station which includes the following information for each station-

(a) name and geographical coordinates;

(b) elevation;

(c) a brief description of the local topography;

(d) category of station and details of observing programmes;

(e) exposure of instruments, including height

above ground of thermometers, rain gauges and anemometers;

(f) a station history including date of beginning of records, changes of site, closure or interruption of records, changes in the name of the station and important changes in the observing programme;

(g) the name of the supervising organization or institution; and

(h) the datum level to which atmospheric pressure data of the station refer.

Siting and exposure

30.-(1) The climatological station operator shall ensure that a station is established and instruments are enclosed in an area of measurements of-

(a) 25m by 25m equal to 82ft x 82ft for a station with many installations; and

(b) 4 m x 4 m equal to 13ft x 13ft for a rainfall station with relatively few installations.

(2) The climatological station operator shall ensure that the climatological station is spaced at an interval not exceeding the minimum horizontal resolution required as described by the Authority.

Composition requirements

31.-(1) A climatological station operator shall ensure that a station is located and set up in a manner to be able to operate continuously for at least ten years, and that the exposure remains unchanged over a long period.

(2) In the cause of observation, the climatological observation may be operated at a different category stations as follows-

(a) in an ordinary climatological station, where the observation is made on of the following elements-

(i) extreme temperatures;

(ii) amount of precipitation, if possible; and

(iii) any other related meteorological elements.

(b) in a principal climatological station, where the

observation is made out of the following elements-

(i) weather;
(ii) wind direction and speed;
(iii) cloud amount;
(iv) type of cloud;
(v) height of cloud base;
(vi) visibility;
(vii) air temperature including extreme temperatures;
(viii) humidity;
(ix) atmospheric pressure;
(x) precipitation amount;
(xi) snow cover or snow depth;
(xii) sunshine duration or solar radiation; and
(xiii) soil temperature.

(c) in a special purpose climatological station established for special observing program and is-

(i) limited in number of its parameters; and
(ii) has its own frequency, spacing and timeliness for observation.

(3) The climatological station operator shall, when observing temperature in the soil at a principal climatological station, ensure that the soil is measured at some or all of the following depths 5, 10, 20, 50, 100, 150 and 300 cm.

Frequency and timing of observations

32.-(1) The climatological station operator shall, when making observation, ensure that all climatological stations are made at fixed times according to UTC.

(2) The climatological station operator shall ensure that the climatological observations made at a climatological station are made at times that reflect the significant diurnal variations of the climatic meteorological elements.

(3) The climatological station operator shall ensure that, when changes are made to the times of climatological observations in a network, simultaneous observations are carried out at a skeleton network of representative stations

at the old times of observation and at the new ones, for a period covering the major climatic seasons of the area.

(c) Agricultural Meteorological Stations

General requirements

33.-(1) The agricultural meteorological station operator shall ensure that the density of the network of each category of agricultural meteorological station permit the delineation of weather parameters on the scale required for agrometeorological planning and operation, taking into account the agricultural features of the country.

(2) The agricultural meteorological station operator shall ensure that an up-to-date directory of the agricultural meteorological stations is maintained, giving the standard metadata including the following information for each station-

(a) name and geographical coordinates;
(b) elevation;
(c) brief description of the local topography;
(d) natural biomass, main agro-systems and crops of the area;
(e) types of soil, physical constants and profile of soil;
(f) category of station, details of observing programme and reporting schedule;
(g) exposure of instruments, including height above ground of thermometers, rain gauges and anemometers;
(h) station history including date of beginning of records, changes of site, closure or interruption of records, changes in the name of the station and important changes in the observing programme; and
(i) name of the supervising organization or institution.

(3) The agricultural meteorological station operator shall ensure that agricultural meteorological station is inspected at regular intervals to make sure that high standard of observation is maintained, in respect of-

(a) quality of meteorological instruments used;

(b) correct exposure of the station and the sensors;
(c) acceptable knowledge and competence of personnel; and
(d) adherence to standards of measurements, observations and reports issued for air navigation users.

Siting and exposure

34.-(1) The agricultural meteorological station operator shall, when installing or establishing an agricultural meteorological station, observe that the station is sited at a location with the following characteristics-

(a) ground covered with short grass or a surface representative of the locality, and surrounded by open fencing or palings to exclude unauthorised persons; and
(b) at a site away from trees, buildings, walls or other obstructions.

(2) The instrument enclosure for an agricultural meteorological station shall be of the following size-

(a) where there are many instalations, the size of a synoptic station shall be 18m by 12m equal to 60ft x 40ft;
(b) for few installations, the minimum size shall be 10m by 7m equal to 33ft x 23ft;
(c) 10m by 10m equal to 33ft x 33ft when AWS is used as agricultural meteorological station.

(3) The enclosure shall be sited in the middle of a buffer zone and aligned in the true North – South direction.

(4) The buffer area around the instrument enclosure shall be-

(a) at least 30m x 30m equal to 98.5ft x 98.5ft; and
(b) covered by the natural vegetation or ground cover of the region which shall be maintained below approximately 0.05m equal to 1.5 ft.

(5) The agricultural meteorological station operator shall ensure that each agricultural meteorological station is located at a place that is representative of agricultural and natural conditions in the area concerned-

(a) at experimental stations or research institutes for agriculture, horticulture, animal husbandry,

forestry, hydrobiology and soil sciences;

(b) at agricultural and allied colleges;

(c) in areas of present or future importance for agricultural and animal husbandry;

(d) in forest areas; and

(e) in national parks and reserves.

Composition requirements

35.-(1) The agricultural meteorological station operator shall, when observing programme at an agricultural meteorological station, in addition to the standard climatological observations, include some or all of the following:

(a) observations of physical environment-

(i) temperature and humidity of the air at different levels in the layer adjacent to the ground, from ground level up to about 10 metres above the upper limit of prevailing vegetation, including extreme values of these meteorological elements;

(ii) soil temperature at depths of 5, 10, 20, 50 and 100 cm and at additional depths for special purposes and in forest areas;

(iii) soil water or volumetric content at various depths, with at least three replications when the gravimetric method is used;

(iv) turbulence and mixing of air in the lower layer including wind measurements at different levels;

(v) hydrometeors and water-balance components including hail, dew, fog, evaporation from soil and from open water, transpiration from crops or plants, rainfall interception, runoff and water table;

(vi) sunshine, global and net radiation as well as the radiation balance over natural vegetation, crops and soils over twenty four hours;

(vii) observations of weather conditions causing direct damage to crops, such as frost, hail, drought, floods, gales and extremely hot, dry winds;

(viii) observations of damage caused by sandstorms and duststorms, atmospheric pollution and acid deposition as well as forest, bush and grassland fires; and

(b) observations of a biological nature-

(i) phenological observations;

(ii) observations on growth as required for the establishment of bioclimatic relationships;

(iii) observations on qualitative and quantitative yield of plant and animal products;

(iv) observations of direct weather damage on crops and animals;

(v) observations of damage caused by diseases and pests; and

(vi) observations of damage caused by sandstorms and duststorms and atmospheric pollution, as well as forest, bush and grassland fires.

Frequency and timing

36. The agricultural meteorological station operator shall ensure that-

(a) the observation of a physical nature is made at the main synoptic times; and

(b) the observation of a biological nature is made regularly or as frequently as significant changes occur, and shall be accompanied by meteorological observations;

(c) soil moisture observations shall be made on 7^{th}, 17^{th} and 27^{th} of the month;

(d) crop phenological phase observations shall be made on Monday, Wednesday and Friday; and

(e) where the days in subregulation (4) are unofficial day, the observation shall be performed a day earlier or later.

(d) Aeronautical Meteorological Stations

General requirements

37.-(1) The aeronautical meteorological station operator shall ensure that data relating to the elevation of an aeronautical meteorological station on land are specified in whole metres.

(2) The aeronautical meteorological station operator shall ensure that aeronautical meteorological stations on land are uniquely identified by index number known as station identifier.

(3) Where the aeronautical meteorological station operator changes the index number of an aeronautical meteorological station on land, he shall include the change in the reports.

(4) The change of index number under subregulation (3) shall be made effective on 1st January or 1st July.

(5) The aeronautical meteorological station operator shall ensure that the stations are inspected at sufficiently frequent intervals to ensure that high standard of observation is maintained, in respect of-

(a) quality of meteorological instruments used;
(b) correct exposure of the station and the sensors;
(c) acceptable knowledge and competence of personnel; and
(d) adherence to standards of measurements, observations and reports issued for air navigation users.

Siting and exposure

38.-(1) The aeronautical meteorological station operator shall ensure that the aeronautical meteorological stations are established at aerodromes and other points of significance for air navigation.

(2) The enclosures, fencing, for instruments at airports shall be installed in such a way that the minimum distance between the enclosure and the-

(a) turning areas and aprons shall be 80m;
(b) runways shall be 60m; and
(c) taxi ways shall be 30m.

(3) The station shall be sited at a location with the following characteristics-

(a) ground covered with short grass or a surface representative of the locality, and surrounded by open fencing or palings to exclude unauthorized persons; and

(b) the site shall be away from trees, buildings, walls or other obstructions.

(4) The instrument enclosure for a surface land synoptic station shall be of the size of 18m by 12m equal to 60ft x 40ft.

(5) The enclosure under subregulation (4) shall be sited in the middle of a buffer zone and aligned in the true North – South direction.

(6) The buffer area around the instrument enclosure shall be-

(a) at least 30m x 30m equal to 98.5ft x 98.5ft; and

(b) covered by the natural vegetation or ground cover of the region which shall be maintained below approximately 0.05m equal to 1.5 ft.

Composition requirements

39. The aeronautical observations shall consist of the following meteorological elements-

(a) surface wind direction and speed;

(b) visibility;

(c) runway visual range, when applicable;

(d) present weather;

(e) cloud amount, type and height of base;

(f) air temperature;

(g) dew point temperature;

(h) atmospheric pressure (QNH and QFE);

(i) supplementary information; and

(j) supplementary information shall contain significant meteorological conditions, particularly those in the approach and climb out areas.

Frequency and timing of observations

40.-(1) The aeronautical meteorological station operator shall ensure that the routine observations is made at intervals of-

(a) one hour; or

(b) at intervals of one half-hour,

as the Authority considers necessary.

(2) Notwithstanding subregulation (1), special observations shall be made in accordance with criteria established by the Authority.

(e) Aircraft Meteorological Stations

Siting and exposure

41.-(1) The aircraft meteorological station shall be a meteorological station situated on an aircraft.

(2) The station shall be sited and exposed on aircraft in accordance to international requirements for weather observations on aircraft.

Composition requirements

42. The aircraft based observations shall consist of at least the following variables, with desirable and optional variables as indicated:

(a) static air temperature;
(b) wind speed;
(c) wind direction;
(d) pressure altitude;
(e) latitude;
(f) longitude;
(g) time of observation;
(h) turbulence;
(i) geometric altitude-desirable;
(j) humidity desirable; and
(k) icing desirable.

Frequency and timing of observations

43. The aircraft meteorological station operator shall make the following aircraft observations:

(a) routine aircraft observations during aircraft takeoff, approach and landing phases, en-route and climb-out phases; and
(b) special and other non-routine aircraft observations during any phase of the flight.

(f) Weather Radar Stations

General requirements

44.-(1) The Authority shall establish and operate a network of weather radar stations for better provision of meteorological services for social-economic development activities.

(2) Each weather radar station shall be uniquely identified by index number known as station identifier.

(3) The Authority shall ensure that while operating weather radars national regulations for the use of radio frequencies are complied with.

(4) The Authority shall ensure that the operated weather radar stations-

(a) are capable of transmitting and receiving horizontally polarized signals;

(b) are capable of transmitting and receiving both horizontally and vertically polarized signals; and

(c) provide observations of the radar reflectivity factor.

Siting and exposure

45.-(1) A person who intends to establish weather radar station shall ensure that the establishment is carried on in an appropriate site.

(2) The appropriate site shall be-

(a) on high ground, with the horizon being as free from obstructions as possible;

(b) one with no extensive obstructions subtending an angle exceeding 6° at the observation point; and

(c) at symmetrical hill with a downward slope of about 6° for a distance of 400 m, in a hollow surrounded by hills rising to a 1° or 2° elevation.

(3) The weather radar station operator shall, when tracking system of a weather radar, provide a firm foundation on which the equipment can be mounted.

(4) The weather radar station operator shall ensure that there are restrictions on the height of buildings or obstacles surrounding a weather radar antenna as follows-

(a) with the centre of the pedestal bottom of a weather radar antenna as the measuring centre,

the highest part of a building or obstacle within a radius of 182m shall be under the horizon of the pedestal bottom;

(b) with the centre of the pedestal bottom of a weather radar antenna as the measuring centre, the highest part of a building or obstacle within the circular belt of an inner radius of 182m and an outer radius of 520m, shall be under an elevation angle of 0.5 degrees.

(5) The restricted height of buildings surrounding a polar orbital satellite tracking antenna shall be measured from the centre of the pedestal bottom of that tracking antenna, the highest part of a building or obstacle shall be under an elevation of three degrees.

Composition requirements

46.-(1) The weather radar station operator shall ensure that single-polarization weather radars provide the following observations-

(a) radial velocity; and

(b) spectral width.

(2) The weather radar station operator shall ensure that weather radars with dual-polarization capability provide the following observations-

(a) differential reflectivity;

(b) cross-polar correlation;

(c) differential phase; and

(d) specific differential phase.

Frequency and timing of observations

47.-(1) The weather radars operated shall make observations available at least every 15 minutes.

(2) The weather radar observational data shall be made available to the Authority.

(g) Rainfall Meteorological Station

General requirements

48.-(1) The measuring of precipitation shall aim to obtain a sample that is representative of the true amount falling over the area which the measurement is intended to represent, whether on the synoptic scale, mesoscale or microscale.

(2) The ordinary rainfall station shall consist of-

(a) standard rain-gauge; and

(b) measuring cylinder.

(3) The observing rainfall station shall be registered by the Authority and the registration information shall comprise of the following-

(a) name of location, village or street, ward, district and region;

(b) date of registration;

(c) location points, latitude, longitude, elevation; and

(d) person managing the station.

(4) A registered rainfall station shall have a unique identification number or index number.

(5) A rainfall meteorological station shall be inspected at sufficiently frequent intervals to ensure high standard of observation is maintained, in respect of-

(a) quality of instruments used;

(b) correct exposure of the station; and

(c) acceptable knowledge and competence of personnel.

(6) The registration of a rainfall station shall cease and its data counted unacceptable, when-

(a) a station stop reporting its observational data for a period of three month without notifying the Authority;

(b) no competent personnel is present to manage the station and to perform meteorological observations;

(c) general conditions for operation of such station no longer give assurance for quality observation of data; and

(d) the Authority decides to close such a station.

Siting and exposure

49.-(1) The rainfall meteorological station shall be at an open space to ensure free collection of rain water.

(2) The raingauge shall be installed at a location where the distance of any obstacle, including fencing, from the raingauge is not less than twice the height of the object above the rim of the gauge, and preferably four times the

height.

(3) Subject to the requirement under subregulation (2), and where an enclosure is required for the station for optimal observations, the enclosure shall be a fencing of-

(a) at least 4m x 4m equal to 13ft x 13ft long; and

(b) not more than 4ft high above the surface.

Composition requirements

50. The rainfall station shall perform observation of the following parameters-

(a) rainfall amount; or

(b) rainfall intensity.

Frequency and timing of observations

51.-(1) The observations from a meteorological rainfall station shall be performed once in twenty four hours.

(2) The observations in subregulation (1), shall be conducted everyday at 0600 UTC.

(h) Hydrometeorological Station

General requirements

52.-(1) Hydrometeorological observing stations shall be classified as-

(a) climatological stations and precipitation stations for hydrological purposes; and

(b) hydrological stations for specific purposes.

(2) The Authority shall-

(a) register all hydrometeorological stations and assign each with a unique code numbers;

(b) carry out station inspection in collaboration with hydrological service provider to ensure proper working of the instruments and accuracy of data; and

(c) provide technical support for installation and regular servicing of the instruments and equipment.

Siting and exposure

53.-(1) A station shall be located at a site which permits correct exposure and functioning of the instruments and satisfactory instrumental and non-instrumental observations.

(2) Each hydrometric and groundwater station shall be located at a place and under an arrangement which will provide for the continued operation of the station for at least ten years, unless it serves a specific purpose which justifies its functioning for a shorter period.

Composition requirements

54. The hydrometeorological stations shall carry out observations, including-

(a) wet and dry bulb temperature;
(b) rainfall;
(c) wind speed and direction;
(d) air humidity;
(e) cloud amount and type; and
(f) evaporation.

Frequency and timing of observations

55.-(1) Where automatic registration is not available, observations of elements for hydrological purposes shall be made at regular intervals which are appropriate for the elements and purposes.

(2) Uniformity in time of observations shall, generally, be observed within a catchment area.

(h) Research or Training Purpose Land Stations

General requirements

56.-(1) The research or training purpose land station shall be established for the aim of collecting data for research or training purpose for the intended period.

(2) A research or training purpose land station shall be registered by the Authority.

(3) The registration under subregulation (2) shall comprise of the following information-

(a) names of location, village or street, ward, district and region;
(b) date of registration;
(c) period intended to operate the station;
(d) location points, latitude, longitude, elevation, and
(e) person managing the station.

(4) A registered station shall have a unique identification number or index number.

(5) A research or training purpose land station shall be inspected at sufficiently frequent intervals to ensure high standard of observation is maintained, in respect of-

(a) quality of instruments used;

(b) correct exposure of the station; and

(c) acceptable knowledge and competence of personnel.

Siting and exposure

57.-(1) The research or training purpose land station shall be sited at a location with the following characteristics-

(a) ground covered with short grass or a surface representative of the locality, and surrounded by open fencing or palings to exclude unauthorised persons; and

(b) at a site away from trees, buildings, walls or other obstructions.

(2) The instrument enclosure for a research or training purpose land station shall be of the size-

(a) where there are many installations, the size of a synoptic station shall be 18m by 12m equal to 60ft x 40ft;

(b) for few installations, the minimum size shall be of the rainfall station of 4m by 4m equal to 13ft x 13ft; and

(c) 10m by 10m equal to 33ft x 33ft for an AWS research or training purpose land station.

(3) The enclosure shall be sited in the middle of a buffer zone and aligned in the true North – South direction.

(4) The buffer zone around the instrument enclosure shall be-

(a) at least 30m x 30m equal to 98.5ft x 98.5ft; and

(b) covered by the natural vegetation or ground cover of the region which shall be maintained below approximately 0.05m equal to 1.5 ft.

Composition requirements

58.-(1) The research or training purpose land station operator shall make observations of weather parameters depending on the area of his interest of research purpose or training.

(2) The research or training purpose land station operator shall ensure that weather observing practice is consistent with respect to a number of parameters observed.

Frequency and timing

59.-(1) The research or training purpose land station operator shall ensure that observations at a research or training purpose land station is conducted at a specified interval of time for the whole period of the existence of the station.

(2) The weather observing practice shall be consistent with respect to time frequency within a day.

(3) The data for a research or training purpose land station shall be transmitted to the Authority.

(i) Tide-Gauge Station

General requirements

60. The Authority shall ensure establishment of adequate network of tide-gauge stations.

Location and Composition

61.-(1) The tide-gauge stations shall be established along coasts subject to storm surge.

(2) The gauges shall be placed in a manner that allows determination of the full range of water heights.

Frequency and timing of observations

62.-(1) The observations of tide height shall be made at the main synoptic times of 0000, 0600, 1200 and 1800 UTC.

(2) In coastal storm situations, hourly observations shall be made.

(j) Automatic Weather Station

General requirements

63.-(1) A meteorological station operator may establish Automatic Weather Station in its acronym AWS to supplement manned weather stations.

(2) Weather parameters measured or recorded shall be stored in a built-in data logger or may be transmitted to

a remote location via a communication link.

(3) The Automatic Weather Station may be used for many purposes including-

(a) increasing the density of an existing network by providing data from sites that are difficult to access or are inhospitable;

(b) providing observations at manned stations outside the normal working hours of the observing staff, for instance during the night or on weekends;

(c) satisfying new observational needs and requirements;

(d) increasing the reliability of the data and standardizing observing methods and timing for all network stations;

(e) cutting costs by reducing the number of manned stations;

(f) placing sensors in meteorologically favourable sites apart from the places of residence and work of the observer.

(g) reducing human errors; or

(h) measuring and reporting with high frequency or continuously.

(4) The Automatic Weather Station may be designed as an integrated concept of various measuring devices in combination with the data-acquisition and processing units. Such a combined system of instruments, interfaces and processing and transmission units is usually called an Automated Weather Observing System in its acronym AWOS or Automated Surface Observing System in its acronym ASOS.

(5) Management of the Automatic Weather Station shall, in principle, follow the same general rules and practices as for the management of manned stations since automatic meteorological stations are generally used to supplement or expand a basic manned station.

Classification of Automatic stations

64. The Automatic Weather Station may be classified into two stations namely-

(a) real-time Automatic Weather Station, which is

a station providing data to users of meteorological observations in real time, typically at programmed times;

(b) off-line Automatic Weather Station, which is a station recording data on site on internal or external data storage devices possibly combined with a display of actual data.

Location and exposure

65.-(1) The guidance regarding siting, exposure and changes in instrumentation shall apply equally to automatic weather stations and to manned weather stations.

(2) There shall not be any difference between the performance and quality of the observational data from manned and automatic stations.

Composition requirements

66. The operator of the Automatic Weather Station shall ensure that the station is able to monitor the following meteorological parameters continuously and on regularly selected time steps:

(a) air temperature (°C);
(b) relative humidity (%) ;
(c) wind speed (m/s);
(d) wind direction (deg clockwise from N);
(e) rainfall (mm);
(f) barometric pressure (mbar);
(g) solar radiation (W/m^2);
(h) soil temperature (°C);
(i) soil moisture (%);
(j) IR (earth) radiation (W/m^2); or
(k) sunshine duration (min).

Conditions for Replacing Manual stations

67.-(1) Where the operator of an Automatic Weather Station replaces a manual observing instrument that has been in operation for a long time, he shall ensure that there is a sufficient overlap in observation systems to facilitate maintaining the homogeneity of the historical record.

(2) The operator of an Automatic Weather Station shall take into account the following general for sufficient

operational overlap between existing and new automated systems:

(a) wind speed and direction for twelve months;
(b) temperature, humidity, sunshine, evaporation twenty four months; and
(c) precipitation for twenty four months.

Frequency and timing

68. The frequency for measurement of meteorological variables shall be set depending on the type of station the Automatic Weather Station serves.

(k) Radar Wind Profiler Station

General requirements

69. A person who operates a radar wind profiler station shall be required to comply with national regulations for the use of radio frequencies.

Quality Control

70.-(1) The Radar Wind Profiler Station shall, like other instruments, adhere to the calibration policy requirements regarding calibration procedures of the system.

(2) The Radar Wind Profiler Station operator shall be required to ensure that inspection checks are made according to the intervals specified by the Authority.

Composition requirements

71. A person who operates radar wind profiler station shall be required to make horizontal wind vector observations and vertical wind component observations.

Frequency and timing

72. The Radar Wind Profiler Station shall be operated continuously so as to acquire and provide horizontal winds at time intervals not exceeding sixty minutes.

PART IV
OBSERVATION OF METEOROLOGICAL PARAMETERS

Observation of atmospheric

73.-(1) The hectopascal (hPa), equal to 100 pascals (Pa), shall be the unit in which pressures are reported for meteorological purposes.

pressure

(2) The atmospheric pressure shall be reduced to mean sea level and observed at every hour.

(3) At aeronautical meteorological stations, the atmospheric pressure shall be measured, and QNH and QFE values shall be computed and reported in hectopascals.

(4) For synoptic report, the reading of the barometer shall be the last observation.

Observation of air temperature and dew point temperature

74.-(1) The temperature and dew point temperature shall be observed every hour and reported in degrees Celsius.

(2) For observation of air temperature the thermometer shall be installed in a thermometer screen.

(3) Thermometers shall be read to at least 0.1 °C.

(4) The daily minimum temperature shall be observed and reported at 0600Z and the daily maximum temperature shall be observed at 1800Z and reported at 0600Z.

Observation of surface wind

75.-(1) The exposure of wind instruments over level, open terrain shall be ten metres above the ground.

(2) Wind speed shall be measured to the nearest unit in metres per second, kilometres per hour or knots, and shall represent, for synoptic reports, an average over ten minutes or, if the wind changes significantly in the ten minute period, an average over the period after the change.

(3) Wind direction shall be measured in degrees and reported to the nearest ten degrees and represent a scalar average over ten minutes or, if the wind changes significantly in the ten minute period, an average over the period after the change.

(4) The “Calm” shall be reported when the average wind speed is less than 1 knot and the direction in this case is coded as 00.

(5) In the absence of an anemometer, the wind speed may be estimated using the Beaufort scale.

(6) At sea stations, in the absence of an appropriate instrument, the wind speed may be estimated by reference to the Beaufort scale and the wind direction by observing

the motion of sea waves.

(7) The output averaging time for wind shall be 2 minutes or 10 minutes.

(8) For the purpose of agro-climatological, wind shall be measured at 2 metres and be reported with flag S to indicate special purpose.

Observation of precipitation for meteorological use

76.-(1) The amount of precipitation shall be the sum of the amounts of liquid precipitation and the liquid equivalent of solid precipitation.

(2) The precipitation shall be observed after every three hours starting from 0600Z.

(3) The daily amount of precipitation shall be reported at 0600Z.

Soil temperature

77.-(1) The measurements shall be made to detect diurnal variations of soil temperature at depths of 5, 10, 20, 50, 100 and in some cases, 200 cm.

(2) The soil surface temperature measurements shall be made for special purposes.

Soil moisture

78.-(1) The gravimetric estimation of soil moisture shall be taken as the average of at least three samples from each depth.

(2) The gravimetric water content shall be expressed as the grams of soil moisture contained in a gram of dry soil.

Evaporation

79.-(1) The observation for evaporation shall be made daily at 0600Z.

(2) At each observation, water temperature and wind run records shall be taken.

(3) The amount of evaporation shall be read in millimetres.

Sunshine duration

80.-(1) The observation for sunshine duration shall be made daily at 0600Z.

(2) The threshold value for bright sunshine shall be 120 W m–2 of direct solar irradiance.

Upper-air observations

81.-(1) Atmospheric pressure, temperature and humidity observations at upper-air synoptic stations shall be made by means of a radiosonde attached to a fast-ascending free balloon.

(2) The upper wind observation at an upper-air synoptic station shall be made by tracking of the fast-ascending free balloon through electronic means.

Visibility

82. The visibility shall be measured or observed hourly and reported in metres or kilometres.

Clouds

83. The cloud amount, cloud type and height of cloud base shall be observed hourly.

PART V
DATA COMMUNICATION AND DISSEMINATION

Communication of information

84.-(1) A meteorological station owner shall be required to register to the Authority.

(2) Meteorological station owners registered under subregulation (1) shall use various communication options of information exchange with the Authority, which may include-

(a) Digital Meteorological Observatory;
(b) Meteorological Aviation Information System;
(c) Marine Meteorological Information System; and
(d) any other information exchange system as the Authority may determine.

Collection and dissemination services

85. Without prejudice to regulation 84, the Authority may provide to meteorological station owners, other means of collection and dissemination of services, such as-

(a) routine collection and dissemination service for time- and operation-critical data and products based on real-time “push” mechanisms, implemented through dedicated telecommunication means providing a guaranteed quality of service;

(b) discovery, access and retrieval service based on a request or reply "pull" mechanism with relevant data-management functions implemented through the internet; and

(c) timely delivery service for data and products based on a delayed-mode "push" mechanism implemented through a combination of dedicated telecommunication means and public data telecommunication networks, especially the internet.

PART VI
GENERAL PROVISIONS

Fees or charges

86.-(1) A person who intends to operate miscellaneous meteorological services shall be obliged to pay fees or charges prescribed under the Second Schedule to these Regulations.

(2) For the purpose of this regulation, "miscellaneous meteorological service" means services which may be conducted or provided other than regulated services specified in the Act.

General penalty

87. A person who contravenes a provision of these Regulations where no penalty has been specifically provided for commits an offence and shall, upon conviction, be liable to a fine of not less than one million shillings but not exceeding three million shillings or to imprisonment for a term of not less than six months but not exceeding twelve months or to both.

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SCHEDULES

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FIRST SCHEDULE

FORMS

FORM NO. 1

Made under regulation 5(2))

APPLICATION FORM FOR REGISTRATION OF METEOROLOGICAL STATION

(1) Particulars of the Applicant

Name of the Applicant (Individual/Company/Institution)		....
Type of business/Work		....
Business identity /Tin number/ registration No.		....
Fill this section if it is a Company/Institution		Company originality *(Tick the appropriate)* Local ☐ Foreign ☐
Physical Address of the applicant		
	Postal Address	....
	Telephone No:	....
	Mobile No:	....
	Email address	....

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	Passport No./National ID No (*For individual)*	.....		
Village/Street	…… ….		Ward	…… …
District	…… ….		Region	…… …

(2) Particulars of the station to be registered

Station information
Name of Station: ……..
Station type (Manned/AWS): .....
Address.....
Coordinates (Lat.:……., Lon.:……, Elevation:……..)
.....
Purpose.....
Type of meteorological instrument/equipment
i. …… vi…….....
ii. …… vii……...
iii. …….. viii……...
iv. ……. ix……....
v. …… x……....
(Provide the list of instrument/equipment hereunder if the space provided above is limited)……
……
……
Telephone..... Mobile.....
Fax..... e-mail.....
Village/Street.....Ward…….……..……
District.....Region.....

(3) Registration application terms and conditions:

The station purported to be registered shall be required to meet the following conditions:

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i. Dully-filled application form is accompanied by an introduction letter from the applicant's hamlet, street or village leaders, institution.

ii. Any intention to change the station particulars shall be done upon approval of the Authority.

iii. A person shall not relocate registered meteorological station without the approval of the Authority.

iv. Where it is necessary to relocate any national referenced meteorological station, the matter shall be subject to approval by the Authority and relocation cost shall be borne by such person.

v. A person operating meteorological station that is not registered by the Authority commits an offence.

vi. Use of calibrated instruments.

vii. Station being located properly.

viii. Necessary instruments and technology used for observation of weather parameters.

ix. Station shall be established for respective purpose as stipulated in this application form.

x. Station owner shall adhere to terms and conditions of maintaining and operating the station.

xi. Station owner shall share the observed data and transmitting them to National Meteorological databank.

xii. The Authority shall, if satisfied with the application send the qualified technical personnel to verify the standard of meteorological station on the cost of the applicant.

Declaration

I_____, the applicant for registration of meteorological station hereby declare that I have carefully read and understood

the details of this form and therefore agree to abide with the terms and conditions for this application.

Applicant's signature:________________________

Date:________________________

(4) FOR OFFICIAL USE ONLY.

The application for registration of meteorological station is recommended for approval as follows:

a. Name: ....,
b. Lat:..........................Lon:……......................Elevation:…........................ ....,
c. Registration number:...,
d. Other information...,
....,

____

____

Name of Reviewing Officer (1) Signature

____

____

Name of Reviewing Officer (2) Signature

FORM NO. 2

(Made under regulation 8(1))

PERMIT APPLICATION FORM

1. Particulars of the Applicant			
Name of the Applicant	....		
Location (City/Town)	....		
Postal address	....	Postal Code	....
Physical Address	....	E-mail Address	....
Telephone No.	....	Fax	....
Nationality	....		
Business	....		
Business Tin number/Registration certificate number		....	
Does the Applicant have qualified personnel in Meteorology? YES ☐ / NO ☐		If yes, please specify (attach evidence):	

2. Information regarding the requested meteorological activity

(a) Category of Meteorological Activity to be undertaken (Check/tick the appropriate)

i. Weather observation ☐
ii. Weather Forecasting ☐

(b) For Weather observation activities, select the type of meteorological stations networks involved:

(i)	Synoptic stations	☐
(ii)	Aircraft meteorological stations	☐
(iii)	Automatic weather stations	☐
(iv)	Radar wind profiler stations	☐
(v)	Weather radar stations	☐
(vi)	Aeronautical meteorological stations	☐
(vii)	Research or Training purpose stations	☐
(viii)	Climatological stations	☐
(ix)	Agricultural meteorological stations	☐
(x)	Rainfall meteorological stations	☐
(xi)	Hydrological meteorological stations	☐
(xii)	Global Climate Observing System (GCOS)	☐
(xiii)	Special meteorological stations	☐
(xiv)	Other	☐

In case of (xiii) or (xiv) please specify

.....
.....,
.....
.....

(c) Are the stations networks already established? YES ☐ / NO ☐

If yes, please mention them:

1. .....,
2. .....,
3. .....,
4. .....,
5. .....

(d) Purpose of engagement in the meteorological activity (ies):

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

.....
(e) Place of meteorological activity i. Location name (Region) of a meteorological station:.……...……. ii. District ……..…….…… iii. Ward ……..…….…… iv. Station name:..…….…….……. v. Latitude:. …… vi. Longitude: ……..……..….. vii. Altitude……

3. Declaration

I....., the applicant of the permit hereby declare that all the information contained in this form is in accordance with facts and truth to the best of my knowledge. In this regard, I have carefully read and understood the details of this form and therefore agree to abide with the terms and conditions as appropriate.

Applicant's signature.....
Date.....

4. FOR OFFICIAL USE ONLY

The application for permit is recommended for approval on the following conditions:

1. The meteorological activity to be performed under this permit is:

   ……

2. For weather observations, the type of meteorological stations networks recommended under this permit includes:

   a. .....,
   b. .....,
   c. .....,
   d. .....,
   e. .....,
   f. ……...

_____

_____

Name of Reviewing Officer (1) Signature

_____

_____

Name of Reviewing Officer (2) Signature

Notice to the Applicant**:**

1. Dully filled application form to be accompanied by an introduction letter from the applicant's hamlet, street or village leaders, or institution.
2. Payments to be done to the Authority.
3. For Weather observation activities, the applicant shall have dedicated personnel with minimum qualification of at least Certificate in Meteorology (from the recognized institution).
4. For Weather forecasting activities, the applicant shall have dedicated personnel with minimum qualification of at least B.Sc. in Meteorology (from the recognized institution).
5. Qualification evidences referred to in Nos. 3 and 4 shall be attached to this application.

SECOND SCHEDULE

(Made under regulation 5(2), 8(2), 12(2) and 86(1))

(A) Fees or Charges for Permit of Meteorological Activities

1. To conduct weather observation (To operate meteorological station)				
Type of Station/Activity	Class of Observing Station	Application Fee (TZS)	Permit Fee (TZS)	Annual Renewal License Fee (TZS)
Class A: Rainfall Station				
Rainfall station	Manned	5,000	20,000	Nil
	Automatic	10,000	300,000	200,000
Class B: Manned or Conventional Stations				
Surface synoptic station	Land Station	50,000	800,000	300,000
Aeronautical meteorological station	Manned			
Agricultural meteorological station	Manned			
Climatological station				
Hydro-meteorological station				
Research-purpose station				
Training-purpose station				
Special-purpose station				
Sea station	NIL	NIL	NIL	NIL

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Class C: AWS Stations				
Automatic Weather Station (AWS)	AWS	300,000	500,000	300,000
Automatic Weather Observing System (AWOS)	AWOS			
Surface synoptic station				
Class D: Radar and Special Stations				
Upper-air synoptic station	Radiosonde	2,000,000	5,000,000	1,000,000
Weather RADAR station	S-band			
	C-band			
	X-band			
RADAR wind profiler station				
Special meteorological stations	Radiation station			
	Lightning location station			
	Tide-gauge station			
	Other remote-sensing profiler stations			
	Meteorological reconnaissance aircraft station			
	Global Atmosphere Watch (GAW) station			
	Planetary boundary-layer station			
2. To conduct Weather and climatic forecast				
Permit for forecasting activities		2,000,000	5,000,000	3,000,000
3. To conduct weather modification activity				
Weather modification		5,000,000	10,000.000	-

(B) Fees and Charges for Registration of Meteorological Stations

Type of Station	Class of Observing Station	Application Fee (TZS)	Registration Fee (TZS)	Renewal Registration Fee (TZS)
Class A: Rainfall Station				
Rainfall station	Manned	50,000	50,000	50,000
	Automatic	50,000	300,000	300,000
Class B: Manned or Conventional Stations				
Surface synoptic station	Land station	50,000	600,000	300,000
Aeronautical meteorological station	Manned			
Agricultural meteorological station	Manned			
Climatological station				
Hydro-meteorological station				
Research-purpose station				
Training-purpose station				
Special-purpose station				
Class C: AWS Stations				
Automatic Weather Station (AWS)	AWS	50,000	500,000	300,000
Automatic Weather Observing System (AWOS)	AWOS			

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Surface synoptic station				
Class D: Radar and Special Stations				
Upper-air synoptic station	Radiosonde	1,000,000	5,000,000	3,000,000
Weather RADAR station	S-band			
	C-band			
	X-band			
RADAR wind profiler station				
Aircraft meteorological station				
Special meteorological stations	Radiation station			
	Lightning location station			
	Tide-gauge station			
	Other remote-sensing profiler stations			
	Meteorological reconnaissance aircraft station			
	Global Atmosphere Watch (GAW) station			
	Planetary boundary-layer station			

(C) Fees or Charges for Miscellaneous Meteorological Services

S/N	METEOROLOGICAL SERVICE	AGREED FEES or CHARGES
1.	Certified meteorological reports	TZS 300,000
2.	Using Intellectual property of the Authority	Costs shall be issued depending on software
3.	Inspection fee for records related to permit	TZS 300,000

Dodoma,
23th June, 2021

LEONARD M. CHAMURIHO
Minister for Works and Transport

GOVERNMENT NOTICE No. 596 Published On. 16/7/2021

THE TANZANIA METEOROLOGICAL AUTHORITY ACT,
(CAP. 157)

———

REGULATIONS

———

(Made under section 54)

———

THE TANZANIA METEOROLOGICAL AUTHORITY (METEOROLOGICAL SERVICES FOR MARINE ACTIVITIES) REGULATIONS, 2021

ARRANGEMENT OF REGULATIONS

Regulation *Title*

THE TANZANIA METEOROLOGICAL AUTHORITY ACT,
(CAP. 157)

———

REGULATIONS

———

(Made under section 54)

———

THE TANZANIA METEOROLOGICAL AUTHORITY (METEOROLOGICAL SERVICES FOR MARINE ACTIVITIES) REGULATIONS, 2021

PART I
PRELIMINARY PROVISIONS

Citation

1. These Regulations may be cited as the Tanzania Meteorological Authority (Meteorological Services for Marine Activities) Regulations, 2021.

Application

2. These Regulations, shall apply to the provision of meteorological services for marine activities in the territorial waters.

Interpretation

3. In these Regulations unless the context requires otherwise-

"maritime" means issues connected with the sea, especially in relation to seaborne trade or naval matters;

"national, regional or Global Observing System "means a system responsible for ensuring that the observations are made at national, regional and international levels according to the prescribed standards, are encoded correctly and are presented for transmission at the times laid down;

"Navtex (Navigational Telex)" means an international automated medium frequency direct-printing service for delivery of navigational and meteorological warnings and forecasts, as well as urgent maritime safety information to ships;

"observation environment" means the minimum environmental space required for accurately acquiring atmospheric information by means of meteorological instruments free from external interference;

"severe weather warning" means the emergent announcement issued in the form of weather forecast to the public in the areas affected when severe weather of possible serious impacts on national economy and people's livelihood is imminent, such as tropical cyclone, tsunami, strong winds, heavy rain, hail, etc.;

"surface synoptic station" means a weather station located on the surface of the Earth, either on land or sea, with instruments and equipment for measuring atmospheric conditions to provide information for weather forecasts and to study the weather and climate;

"the marine environment" includes the open and coastal ocean, estuaries, large lakes, rivers and their interfaces with the land and the atmosphere;

Cap. 165 "Tanzanian ship" means a ship registered or licensed under the provisions of theMerchant Shipping Act at a port in the United Republic;

“territorial waters” means any territorial or inland waters of the United Republic;

"tsunami warning" means a warning issued to draw the attention to the potential occurrence of tsunami wave caused by an earthquake under the Oceans or lake;

"tsunami report" means a report on the result of tsunami observation.

"Voluntary Observing Scheme" means scheme of Meteorological services of most maritime countries made arrangements with ships regularly visiting their shores to take marine meteorological observations and transmit them to shore at no cost to the ship;

"warnings" means the forecasts issued to warn or advise of

severe weather events such as tropical cyclone, tsunami, strong winds, heavy rain, hail and large waves; and

"weather forecast" means the general terminology for weather forecast, climate prediction and various specialized meteorological forecasts.

PART II
MONITORING AND COORDINATION OF THE MARINE WEATHER SITUATION

Monitoring of marine weather situation

4. Any person who intends to engage in operating meteorological station or forecasting activities over the territorial waters shall be required to-

(a) continuously monitor current observations, advisories, forecasts and warnings of weather and marine parameters including significant weather phenomena;

(b) determine the need for issuance, cancellation or amendment or update of advisories, forecasts and warnings; and

(c) use performance criteria and background knowledge and skills in analysing and monitoring of weather situation, forecasting marine weather phenomena, ensuring quality of services and their dissemination.

Coordination of observational networks and data management

5. A Meteorological station operator shall be coordinated by the Authority the through following frameworks-

(a) the national, regional and Global Observing System;

(b) the Voluntary Observing Scheme; and

(c) the Ship of Opportunity Programme.

Ship selection and observation; transmission and archiving

6.-(1) Meteorological station operator may be arranged by the Authority for a selection of Voluntary Observation Ships to be equipped with tested marine meteorological instruments using the following selection

criteria-

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(a) vessel registration under Merchant Shipping Act;

(b) willingness of ship-owner;

(c) ship space for installation of all necessary instruments;

(d) ship staff capacity to record and transmit the meteorological observations during synoptic hours;

(e) weather reception mechanism;

(f) parameters to be observed;

(g) ship route (regarding the area of interest); and

(h) identify fixed and anchored platform stations regarded as ships.

(2) The meteorological station operator shall take records and transmit marine meteorological observations according to World Meteorological Organisation standards times for surface synoptic observations.

(3) The companies involved in shipping business may-

(a) involve as many of their ships as practicable in making and recording of weather observations;

(b) be encouraged in collection of meteorological data by ships at sea;

(c) arrange for data examination, dissemination and exchange and encourage the use of meteorological instruments of a high degree of accuracy; and

(d) arrange for the reception and transmission of weather messages from and to ships, using the appropriate shore-based facilities for terrestrial and space radio-communications services.

(4) The ship master may be encouraged by the Authority to inform other ships in the vicinity and also shore stations whenever they experience a wind speed of fifty knots or more as prescribed in the First Schedule to these Regulations.

(5) When in the vicinity of a tropical cyclone, or of a suspected tropical cyclone, ships may take and transmit

their observations at more frequent intervals whenever practicable, bearing in mind navigational preoccupations of ships' officers during storm conditions.

(6) The ship company's owners shall transmit meteorological observations using the ship's terrestrial or space radio-communications facilities for the benefit of various national meteorological services.

PART III
ISSUANCE OF MARINE WEATHER FORECASTS AND WARNINGS

Provision of marine weather services

7.-(1) Any person who engages in meteorological activities over the sea may provide to other maritime users with marine meteorological services and related oceanographic information including tsunami safe navigation and high efficiency of operations, using adequate modes of dissemination.

(2) The services to be provided shall comprise of the following:

(a) in territorial waters, coastal, offshore, ports and harbours shall include-

(i) warnings on tropical cyclones;

(ii) daily weather forecasts, state of sea or lake and forecasts of winds, waves and tides;

(iii) weather instruments for marine observations;

(iv) severe weather warnings;

(v) tsunami warning and advisories;

(vi) distribution of sea surface temperature for identification of fishing grounds;

(vii) up-welling and sea currents;

(viii) weather reports for seaweed farmers;

(ix) phases of the moon for determining fish concentrations;

(x) cloudiness or sunshine hours;

(xi) length of dry or wet season;

(xii) specific meteorological data including

relative humidity and temperature; and

(xiii) support services for search and rescue;

(b) support services for the International Maritime Organisation or International Hydrographic Organisation Worldwide Navigational Warning Service;

(c) support services for marine environmental emergency response;

(d) marine climatology; and

(e) training in marine meteorology.

Principles of marine meteorological services

8. Any person engaged in provision of marine meteorological services shall be required to observe the following principles:

(a) satisfaction of the requirements for information on marine environmental conditions and phenomena;

(b) designed for the safety of marine operations and to promote the efficiency and economy of marine activities;

(c) guided on the use and interpretation of meteorological and related oceanographic information; and

(d) International Standards for the dissemination of internationally coordinated marine meteorological information, forecast and warning services.

Provision of marine weather forecasts and warnings

9.-(1) Any person who intends to engage in forecasting activities over the sea shall be obliged to provide forecasts and warnings of marine weather phenomena and climate services to users about the spatial extent, onset and cessation, duration, intensity and temporal variation.

(2) The services provided under subregulation (1) shall-

(a) ensure that forecasts of weather parameters and phenomena are consistent across boundaries of the area of responsibility as far as practicable;

(b) maintain meteorological integrity which includes monitoring forecasts or warnings issued for other regions, and liaison with adjacent regions as required;
(c) facilitate the formulation of Standard Operating Procedures governing the issuance of marine weather forecasts and severe weather warnings;
(d) issue a tsunami report immediately after the earthquake event has occurred when the occurrence of earthquake under the ocean and tsunami event could not be predicted in advance;
(e) issue a tsunami warning immediately with respect when the Authority judges a tsunami would arrive and influence the coastal area;
(f) issue a report on the cancellation of tsunami warning accordingly when the Authority determines that the severe weather threat has no more significant impact;
(g) issue information of tropical cyclones in a timely way, when it moved into the area of latitude 5−25 degrees South, and longitude 45−60 degrees East;
(h) strive to obtain a uniform procedure in regard to the international meteorological services already specified, and as far as practicable, to conform to the technical regulations and recommendations made by the World Meteorological Organisation; and
(i) supply information in suitable format for transmission in coordination with relevant institutions.

PART IV
COMMUNICATION OF MARINE WEATHER INFORMATION

Communication of marine meteorological

10. Subject to regulation 9, any person who engages in provision of forecasting services over the sea shall be required to-

information

(a) communicate marine weather forecasts and warnings in a timely manner to meet maritime user community needs;
(b) disseminate marine meteorological information on approved satellite service provider platforms and NAVTEX in accordance with the Global Maritime Distress Safety System (GMDSS) Master Plan;
(c) ensure that all forecasts and warnings are disseminated via the authorized communication options to the ships and other user groups in collaboration with maritime administrations in the United Republic;
(d) issue and disseminate weather forecasts, warnings, synoptic and other meteorological data intended for ships in the best position to serve various coastal and high seas areas, in accordance with mutual arrangements;
(e) arrange and make available daily marine weather forecasts for ports and harbours, coastal zone and high sea for the information of departing ships;
(f) provide route documentation to departing ships at meteorological port offices;
(g) provide briefing and consultation, on request, to ship crew members; and
(h) issue tsunami warning.

Port and harbour, coastal zone and high sea users

11. The operator of a ship and other relevant users of the sea shall take-

(a) the responsibility of ensure that they have compatible information communication facilities to and from the Authority for appropriate use and take the necessary responses; and
(b) action on severe weather warnings issued and disseminated by the Authority.

PART V
OFFENCES AND PENALTIES

Offences for unlawful issuing of weather forecast and warnings

12. Any person who unlawfully issues marine severe weather warnings to public commits an offence, and upon conviction shall be liable to a fine of not less than fifty million shillings but no exceeding one hundred million shillings or to imprisonment for a term not less than five years but not exceeding ten years or to both.

General penalty

13. A person who contravenes a provision of these Regulations where no penalty has been specifically provided for commits an offence and upon conviction shall be liable to a fine of not less than one million shillings but not exceeding three million shillings or to imprisonment for a term of not less than six months but not exceeding twelve months or to both.

SCHEDULE

MONITORING OF THE MARINE WEATHER SITUATION

(Made under regulation 6 (4))

Standard Operating Procedure for Forecasting Winds and Waves

Beaufort Scale of Wind Force

Effect of Wind	Descriptive Term	Mean Wind Speed (Kt)	Speed Range (Kt)	Beaufort Number
Calm, smoke rise vertically	calm	00	Less than 1	0
Wind direction shown by smoke, but not by wind vane	Light air	02	1-3	1
Wind left on face; Leaves move slightly; ordinary vanes moved by wind	Light breeze	05	4-6	2
Leaves and small twigs in constant motion wind extends light flag	Gentle breeze	09	7-10	3
Raises dust and loose paper; small branches are moved	Moderate breeze	13	11-16	4
Small trees in leaf begin to sway; crested wavelets form on inland lakes	Fresh breeze	19	17-21	5
Large branches in motion; overhead wires make a wrestling sound	Strong breeze	24	22-27	6
Whole trees in motion, some difficulty in walking against the wind	Near gale	30	28-33	7
Breaks twigs off trees, much difficulty experienced when walking against the wind	Gale	37	34-40	8

Slight damage to building and other structures	Strong gale	44	41-47	9
Seldom experienced inland; trees uprooted; considerable structural damage occurs	Storm	52	48-55	10
Very rarely experienced inland; wide spread damage	Violent storm	60	56-63	11
Hurricane really experienced over land	Hurricane		64 and over	12

Dodoma,
23th June, 2021

LEONARD M. HAMURIHO
Minister for Works and Transport

GOVERNMENT NOTICE No. 597 Published On. 16/7/2021

THE TANZANIA METEOROLOGICAL AUTHORITY ACT,
(CAP. 157)

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REGULATIONS

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(Made under section 54)

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TANZANIA METEOROLOGICAL AUTHORITY (METEOROLOGICAL SERVICES FOR AGRICULTURE, CLIMATOLOGY, RESEARCH, ENVIRONMENT AND HYDROLOGY) REGULATIONS, 2021

ARRANGEMENT OF REGULATIONS

GN. NO. 597 (Contd.)

THE TANZANIA METEOROLOGICAL AUTHORITY ACT,
(CAP. 157)

REGULATIONS

(Made under section 54)

THE TANZANIA METEOROLOGICAL AUTHORITY (METEOROLOGICAL SERVICES FOR AGRICULTURE, CLIMATOLOGY, RESEARCH, ENVIRONMENT AND HYDROLOGY) REGULATIONS, 2021

PART I
PRELIMINARY PROVISIONS

Citation

1. These Regulations may be cited as the Tanzania Meteorological Authority (Meteorological Services for Agriculture, Climatology, Research, Environment and Hydrology) Regulations, 2021.

Application

2. These Regulations shall apply to the application of meteorological services for agriculture, climatology, research, environment and hydrology.

Interpretation

3. In these Regulations, unless the context requires otherwise-

Cap. 157

"Act" means the Tanzania Meteorological Authority Act;

"Authority" means the Tanzania Meteorological Authority established under section 4 of the Act;

"agriculture" means a collective term for field and garden crops, livestock and fish production;

"agricultural extension agents" means the persons specialized in a topic of agricultural science and animal science including agrometeorologists, agronomists, soil scientists, plant pathologists, entomologists, horticulturists, and specialists from agricultural extension, animal husbandry and plant breeding;

"agricultural meteorological station" means a station that provides meteorological data for agricultural or biological purposes and makes other meteorological observations under the programmes of Agrometeorological Research Centres and other relevant organizations;

"agrometeorological bulletin" means a text comprising meteorological formation preceded by an appropriate heading;

"agrometeorological forecast" means a statement of expected meteorological conditions or weather elements that immediately affect farm planning or operations at particular space and time;

"agrometeorological information" means meteorological report, analysis, forecast, and any other statement relating to existing or expected meteorological conditions;

"agrometeorological report" means a statement of observed agrometeorological conditions related to a specified time and location;

"climatological data" means various types of data instrumental, proxy, historical which constitute the major source of climate study and theory;

"explanatory metadata" means the details and history of local conditions of the observing stations, instruments, operating procedures as well as information describing data sets and data processing algorithms and other factors pertinent to using and interpreting the data;

"hydrometeorological stations" means meteorological stations making observations on meteorological elements for hydrological purposes;

"meteorological elements" means any of the subjects of meteorological observations such as wind direction, air temperature, relative humidity, atmospheric pressure, sunshine hours, present weather and aerological soundings;

"meteorological stations" means a facility, either fixed or mobile on land, sea or space with instruments to measure atmospheric conditions;

"meteorological observation" means evaluation of one or more meteorological elements;

"pollution of the sea" means the introduction of harmful substances resulting from human activity to the sea;

"severe weather warning" means the emergent announcement issued in the form of weather forecast to the public in the areas affected when severe weather of possible serious impacts on national economy and people's livelihood is imminent, such as tropical cyclone, cold spell, strong winds, heavy rain or snow, hail, etc.;

"tailor-made" means specialized meteorological services provided for agriculture sector, customer or clients; and

"user" means any agricultural decision maker such as a farmer, extension agent, Government official, media, person, researcher, or the general public.

PART II
METEOROLOGICAL SERVICES FOR AGRICULTURE

Establishment of agro-meteorological station

4.-(1) A person who intends to establish a new or maintain existing agrometeorological station shall ensure that the station is adequate for the provision of the agro-meteorological services.

(2) The agricultural meteorological station shall be located at a place that is representative of agricultural and natural conditions in the area concerned, namely-

(a) at experimental stations or research institutes for agriculture, horticulture, animal husbandry, forestry, and soil sciences;

(b) at agricultural and allied colleges;

(c) in areas of present or future importance for agricultural and animal husbandry;

(d) in forest areas;

(e) in national parks and reserves; and

(f) at any other place as the Authority may consider necessary for the purpose.

(3) The functions of agrometeorological stations

shall be-

(a) to carry out observations of physical environment and biological nature;

(b) to prepare various reports as necessary to meet the needs of agricultural operations and related research; and

(c) to perform any other function which may support agricultural activity.

Observation and reporting of agrometeorological data

5.-(1) The observation and reporting of agrometeorological data of physical environment shall include-

(a) temperature and humidity of the air at different levels in the layer adjacent to the ground, from ground level up to about 10 metres above the upper limit of prevailing vegetation, including extreme values of the meteorological elements;

(b) soil temperature at depths of 5, 10, 20, 50 and 100 cm and at additional depths for special purposes and in forest areas;

(c) soil water or volumetric content at various depths, with at least three replications when the gravimetric method is used;

(d) turbulence and mixing of air in the lower layer including wind measurements at different levels;

(e) hydrometeors and water-balance components including hail, dew, fog, evaporation from soil and from open water, transpiration from crops or plants;

(f) sunshine, global and net radiation as well as the radiation balance over natural vegetation, and crops and soils over twenty four hours; and

(g) observations of weather conditions producing direct damage to crops, such as frost, hail, drought, floods, gales and extremely hot dry winds.

(2) The following observations shall be of biological nature-

(a) crop phenological phase for establishment of bioclimatic relationships;

(b) observations on qualitative and quantitative yield of plant and animal products;

(c) observations of direct weather damage on crops and animals such as adverse effects of frost, hail, drought, floods, gales;

(d) observations of damage caused by diseases and pests; and

(e) observations of damage caused by sandstorms and dust storms and atmospheric pollution, as well as forest, bush and grassland fires.

Publication of agrometeorological data

6.-(1) An agrometeorological station operator may be required to periodically publish, agricultural meteorological data when the need for information is not met by other climatological publications and shall make such information available to the Authority.

(2) The published agricultural meteorological data shall include the following:

(a) frequency, duration and threshold values of the different elements; and

(b) mean values, and other statistical parameters including standard deviation, mean error, quintiles which are necessary for determining the probability of different values.

(3) The published soil-temperature data shall include information concerning-

(a) soil type;

(b) soil cover and surface management;

(c) degree and direction of slope of ground; and

(d) any other information related to soil temperature.

(4) The published soil-moisture data shall include the following information-

(a) soil type;

(b) soil cover;

(c) physical constants of the soil, including bulk density, moisture content at field capacity and moisture content at permanent wilting point; and

(d) any other information related to soil temperature.

(5) The published potential or actual evapo-transpiration data shall include-

(a) short description of equipment or method used;

(b) type of soil in the area of observation; and

(c) vegetation cover and surrounding conditions.

Meteorological forecast for agriculture

7.-(1) A person who intends to carry out meteorological forecasts for agriculture shall be required to follow the forecasting programme for agricultural purposes, which include-

(a) regular and detailed forecasts for agriculturists and foresters and seasonal to inter-annual predictions of the likelihood of climatic anomalies, including temperature, rainfall and other climate variables, specifying local variations in weather to the greatest possible extent;

(b) forecasts related to the selection of the most favourable weather conditions for preparing the soil, planting, cultivating and harvesting crops, and for other agricultural operations;

(c) forecasts for the control of crop and animal pests and diseases; and

(d) warnings of hazardous weather conditions such as strong winds, hail, frost, droughts, floods, gales, waterspouts, and heavy rains.

(2) The person may provide tailored forecasting services relevant to animal husbandry and fisheries to be interpolated by experts in respective sector with the following general information for-

(a) livestock-

(i) temperature;

(ii) humidity;

(iii) solar radiation;
(iv) cloud cover;
(v) severe weather warnings including extreme temperatures, heavy rain, snow, hail;
(vi) flood warnings;
(vii) wind
(viii) drought;
(ix) soil temperatures; and
(x) evaporation indices.

(b) fisheries-
(i) severe weather warnings;
(ii) wind speed and wind direction;
(iii) rainfall;
(iv) temperature;
(v) evaporation indices;
(vi) drought warnings;
(vii) tidal heights; and
(viii) wave height.

Preparation of agrometeorological information

8. A person involved in agricultural activity may, when requiring agrometeorological information, provide to the meteorological service provider information including-

(a) present crop status detailing the types, state and phenological stage of crops;
(b) infestations of pests and diseases and their severity;
(c) other crop stresses such as nutrient stress, water stress and thermal stress; and
(d) pasture conditions.

PART III
METEOROLOGICAL SERVICES FOR CLIMATOLOGY OR RESEARCH

Collection, maintenance and transfer of climatological data

9.-(1) A person who carries out climatological activity shall transmit data to the national meteorological databank after the end of the month and not later than the fifth day of the following month.

(2) A person involved in climatological data collection shall be required to provide a comprehensive metadata to enable access, retrieval and use of data without ambiguity or uncertainty.

Meteorological services for research

10.-(1) A person conducting research shall use meteorological services for the following:

(a) conducting environmental and climate related research;
(b) research activities in relation to policy designing and formulation;
(c) climate change researches and studies;
(d) case studies on extreme weather events;
(e) researches that leads to make proper decision for socio economic planning; and
(f) any other related research activity.

(2) Subject to subregulation (1), a person who intends to conduct research related to meteorology shall bear the cost of data, consultancy or technical advices provided for under the Schedule to these Regulations.

Case studies on extreme weather events

11. Where appropriate, any agrometeorological station operator may carry out case studies on significant weather events which shall assist in the important step of using research findings to improve operational activities and service delivery of meteorological services.

PART IV
METEOROLOGICAL SERVICES FOR ENVIRONMENT

Meteorological services for environment

12. A person who intends to engage in environmental management activity shall use meteorological services on the following:

(a) Environmental Impact Assessment and strategic environmental assessment;
(b) pollution abatement;
(c) waste disposal sites, management, and transport of waste;
(d) management of deposition of particles from the manufacturing industries, including,

fertilizer and cement;

(e) oil spill management, including natural dispersal of the oil, and the direction that odours may travel; and

(f) any other related activity.

PART V
METEOROLOGICAL SERVICES FOR HYDROLOGY

Collaboration with hydrological service provider

13. A person who intends to engage in provision of hydrological service, shall be required to use meteorological services for-

(a) management of dams and river flow discharge;

(b) planning and management of water resources and basins; and

(c) flood management.

PART VI
GENERAL PROVISIONS

General penalty

14. A person who contravenes a provision of these Regulations which no specific penalty has been provided for, commits an offence and upon conviction shall be liable to a fine of not less than one million shillings but not exceeding three million shillings or to imprisonment for a term of not less than six months but not exceeding twelve months or to both.

SCHEDULE

(Made under regulation 10(2))

CHARGES FOR DATA CONSULTANCY AND TECHNICAL ADVICES

Data Category	Number of years	Type of customer and cost for three meteorological parameters and one station		
		International Firm	Government institution/ Local Private Firm	Individual
Daily	1	374,400	220,800	169,600
	5	1,296,000	528,000	272,000
Monthly	1	163,200	86,400	60,800
	5	624,000	240,000	112,000
	10	1,200,000	432,000	176,000
Annual	1	28,800	25,600	24,533
	5	48,000	32,000	27,000
	10	72,000	40,000	29,333

NOTE: Where the number of years, parameters and stations requested by the customer are not indicated in the Schedule, computations shall be made.

Dodoma,
23th June, 2021

LEONARD M. CHAMURIHO
Minister for Works and Transport

GOVERNMENT NOTICE No. 598 Published On. 16/7/2021

THE TANZANIA METEOROLOGICAL AUTHORITY ACT,
(CAP. 157)

REGULATIONS

(Made under section 54)

THE TANZANIA METEOROLOGICAL AUTHORITY (METEOROLOGICAL EQUIPEMENT AND INSTRUMENTS) REGULATIONS, 2021

ARRANGEMENT OF REGULATIONS

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SCHEDULE

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THE TANZANIA METEOROLOGICAL AUTHORITY ACT,
(CAP. 157)

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REGULATIONS

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(Made under section 54)

THE TANZANIA METEOROLOGICAL AUTHORITY (METEOROLOGICAL EQUIPEMENT AND INSTRUMENTS) REGULATIONS, 2021

PART I
PRELIMINARY PROVISIONS

Citation

1. These Regulations may be cited as the Tanzania Meteorological Authority (Meteorological Equipment and Instruments) Regulations, 2021.

Application

2. These Regulations shall apply to meteorological station operators, equipment and instruments related in the provision of meteorological services.

Interpretation

3. In these Regulations, unless the context otherwise requires-

Cap. 157

"Act" means the Tanzania Meteorological Authority Act;

"Authority" means the Tanzania Meteorological Authority established under section 4 of the Act;

"calibration" means a comparison of two instruments or measuring devices one of which is a standard of known accuracy traceable to detect, correlate, report or eliminate by adjustment, any discrepancy in accuracy of the instrument measuring device being compared to the standard;

"maintenance regime" means the recommended maximum interval between inspections of the entire measuring system to confirm correct site exposure, radiation shield or screen and other mechanical mounting fixtures are clean and serviceable and the logger or weather station is clean and serviceable;

"meteorological instruments" means the equipments used

to sample the state of atmosphere at a given time;

"resolution" means the smallest quantity that should be available from the measuring systems data output;

"starting threshold" means the smallest environmental stimulus required for a sensor to produce an output;

"traceability" means the linking of measurement standards or measuring instruments to relevant national or international standards through an unbroken chain of comparisons;

"uncertainty" means an interval around a measured value such that any repetition of the measurement will produce a new result that lies within this interval;

"verification regime" means the recommended maximum interval between field verifications performed against traceable travelling references in suitable conditions; and

"weather observing systems" means systems which-

(a) sense meteorological parameters, process and disseminate;

(b) detect, process and produce imergeries; and

(c) receive space based meteorological data, process and produce imergeries or forecasts.

PART II
METEOROLOGICAL INSTRUMENTS AND OBSERVING SYSTEMS

Meteorological instruments

4.-(1) For the purpose of monitoring the situation of the atmosphere, there shall be measuring instruments for making meteorological observations.

(2) Subject to subregulation (1), the instruments shall include-

(a) thermometers;

(b) barometers;

(c) raingauge;

(d) wind anemometer;

(e) wind vane;

(f) global radiation sensor;

(g) diffused radiation sensor;

(h) direct radiation and sunshine recorder;

(i) soil temperatures;
(j) evaporation pan;
(k) visibility sensor;
(l) present weather sensor; and
(m) any other instrument deems necessary.

(3) For proper surface observations, the instrument shall be positioned as prescribed under these Regulations.

Thermometers

5.-(1) The thermometer mounting height for air temperature measurement shall be 1.25 to 2 m above ground level.

(2) The exposure and siting requirement for thermometer shall be-

(a) a flat, horizontal land, surrounded by an open space, slope inclination less than ⅓ (19°); and
(b) the ground covered with natural and low vegetation less than 10cm representative of the region.

(3) The temperature measurement point shall be situated-

(a) at more than 30 m from artificial heat sources or reflective surfaces;
(b) at more than 30 m from an expanse of water; and
(c) away from all projected shade when the sun is higher than 7°.

(4) When electrical thermometers are used, separate maximum and minimum thermometers shall not be required for measurement of extreme values, if connected to a continuously operating data recording system.

Barometers

6.-(1) The barometer shall be mounted-

(a) in such a manner as to avoid mechanical shock and vibration; and
(b) away from electromagnetic sources.

(2) Without prejudice to subregulation (1), the barometers with digital read-outs shall be mounted where there is good general lighting and shall not face a window or other strong light sources.

Rain gauge

7. The siting and exposure requirement for a rain gauge shall be-

(a) a flat, horizontal land, surrounded by an open area, slope less than ⅓ (19°); and

(b) such that no obstacles situated at a distance at least twice the height of the obstacle with respect to the catchment's height of the raingauge.

Wind anemometer and wind vane

8. The siting and exposure requirement for wind anemometer and wind vane shall be such that-

(a) the mast be located at a distance of at least 10 times the height of the surrounding obstacles; and

(b) the sensors be situated at a minimum distance of 15 times the width of thin obstacles over 8 m high.

Global and diffused radiation sensor

9. The siting and exposure requirement for the global and diffused radiation sensor shall be such that-

(a) no shade projected onto the sensor when the sun is at an angular height of over 7°; and

(b) no non-shading reflecting obstacles with an angular height above 7° and a total angular width above 20°.

Direct radiation and sunshine recorder

10. The siting and exposure requirement for the direct radiation and sunshine recorder shall be such that no shade projected onto the sensor when the sun is at an angular height of over 5.

Soil thermometer

11.-(1) The site for soil temperature measurements shall be a level plot of bare ground and typical of the surrounding soil for which information is required.

(2) The thermometers shall not be in shadows cast while the elevation of the sun is 3˚ or greater above the horizon and shall not be placed in a hollow where water can accumulate.

(3) The soil shall be representative of the soil for the locality and not disturbed by civil works and the water

table shall not rise to the level of the deepest thermometer.

(4) The standard depths for soil temperature measurements shall be 5, 10, 20, 50 and 100 cm below the surface and additional depths may be included.

Stevenson screen

12.-(1) The Stevenson screen shall be installed in the instrument enclosure.

(2) The base of the screen shall be 4 feet above the level of the surrounding ground.

(3) The bulbs of the thermometers or the electrical transducers in shelters of the Stevenson screen shall be at the height of approximately 4½ feet above ground level.

Evaporation pan

13.-(1) The standard evaporation pan shall be circular, 4 feet in diameter and 10 inches deep.

(2) The interior of the evaporation pan shall be painted with a black bituminous paint to absorb as much as possible of the incoming solar radiation, and the exterior including the protective mesh grid, shall be painted with aluminium paint to reduce radiation loss.

(3) The site requirements shall be such that-

(a) no obstructions which shall cast a shadow onto the pan when the sun is at an elevation of 3˚ or greater;

(b) the ground surface surrounding the pan be relatively level and have the vegetative cover trimmed to a few centimetres above the ground; and

(c) the distance of the evaporation pan from isolated obstructions which are higher than the top of the pan be not less than ten times and preferably thirty times their height above the rim of the pan.

Runway visual range

14.-(1) The runway visual range shall be at 120m literally from the centre of the runway and at a height of between 2 and 3 metres.

(2) The path of the light beam between the transmitting and receiving shall not be closer to the ground than 1.5 metres at any point.

Present weather sensor

15.-(1) The present weather sensor shall be at the height of approximately 1.5 metres above the ground level.

(2) The siting and exposure requirement shall be such that no obstacles situated at a distance at least twice the height of the obstacle.

Meteorological parameters

16.-(1) The meteorological station operator shall ensure that there is compliance with the standards of instruments in the following measuring meteorological parameters-

(a) atmospheric pressure;
(b) air temperature;
(c) relative humidity;
(d) precipitation;
(e) wind direction;
(f) wind speed;
(g) solar radiation;
(h) visibility;
(i) runway visual range;
(j) present weather;
(k) cloud height;
(l) soil temperature;
(m) soil moisture;
(n) soil ph; and
(o) any other related meteorological parameter.

(2) Any person intending to procure meteorological instrument shall submit specifications to the Authority for verification.

Classes of meteorological instruments

17.-(1) The meteorological station operator shall categorise meteorological instruments into the following classes:

(a) Class A-Reference Climatological Stations and Research Stations;
(b) Class B- Synoptic Stations and Controlled Aeronautical Stations;
(c) Class C- Well-Maintained Public Weather Stations; and
(d) Class D- Measurements at Crowdsourced

Weather Stations.

(2) The performance of the classes shall be as prescribed in the Schedule to these Regulations.

Meteorol-ogical instruments approval

18.-(1) The meteorological station operators shall be required to ensure that meteorological instruments are approved by the Authority, based on classes of instruments and issue a certificate.

(2) The approved instruments shall not be modified without the approval by the Authority.

Instruments uncertainty

19. The meteorological station operators shall be required to ensure that the instruments used for meteorological purposes have uncertainty in instruments performance specification as prescribed in the Schedule to these Regulations.

Display of labels

20. The Authority shall affix the following approval labels to the approved meteorological instruments:

(a) logo of the Authority;
(b) type of the equipment;
(c) alphanumeric identifications; and
(d) any other label as the Authority may consider appropriate.

Installation of approved meteorolo-gical instrument

21.-(1) The meteorological instruments shall be installed by qualified technical personnel.

(2) The installation shall be inspected and certified by the Authority before the use of the instrument.

Weather observing systems

22.-(1) The meteorological station operators shall establish weather observing systems performing meteorological observations, detection of severe weather events and alerts.

(2) The weather observing systems established shall include-

(a) automatic weather station;
(b) semi-automatic weather station;
(c) automatic weather observing system;
(d) low level wind shear alert system;

(e) lightening detection system;
(f) upper air station;
(g) observing satellite;
(h) weather radars; and
(i) any other weather observing system.

Installation of weather observing systems

23. Subject to regulation 11, the weather observing systems shall be installed by a qualified meteorological technician under supervision of meteorological engineer according to standards and manufacturer guidelines and such installations shall be certified by the Authority before the use of the system.

PART III
MAINTENANCE AND CALIBRATION OF METEOROLOGICAL INSTRUMENTS

Performance of calibration

24.-(1) The meteorological station operators shall be required to ensure that calibration are performed when the calibration cycle is due or the observation instrument show an error caused by natural disaster or other causes.

(2) The calibration of meteorological instrument shall be conducted at a calibration laboratory.

(3) On site calibration may be performed upon request and application of the exclusive observation station under at least one of the following conditions-

(a) the instrument is too big to move;
(b) the instrument is hard to tear apart; or
(c) the instrument may be exposed to damages or lose its accuracy while moving or any other consideration.

(4) The observation instrument sent for calibration shall bear marks of the brand of production or factory logo, serial number of production, engraved scale and the vernier, the attached technical document or brochures shall also be submitted for calibration's reference.

(5) Auto-recording types of instrument for calibration shall be submitted with its recording or displaying device and power supply exclusively used for the instrument shall also be submitted.

(6) Where the instrument sent for calibration has two or more scales and after calibration, any one of them fails to meet the performance criteria, the whole instrument shall be considered as failed.

(7) For weather observing systems requiring calibration, such as weather radars, manufacturer calibration procedures shall be used.

Calibration certificate

25. The Authority shall-

(a) issue a certificate to the instruments that passed the calibration;

(b) mark obsoletes all instruments if calibration fails; and

(c) provide recommendations or advice to customer in accordance with the requirements.

Traceability

26. The meteorological station operators shall ensure traceability of calibration of meteorological instruments through recognized national and international institutions dealing with standards.

Calibration regime

27. The meteorological station operators shall ensure that calibration cycles of meteorological instruments follow manufacturer recommendations and the calibration cycles as prescribed in the Schedule to these Regulations.

Instruments maintenance

28.-(1) The meteorological station operators may establish preventive maintenance schedule for instruments as a means of preventing prolonged downtime, costly repairs, data loss and quality control.

(2) The maintenance schedule referred to under subregulation (1) shall follow manufacturer recommendations.

(3) The corrective maintenance shall be done within reasonable time to minimize downtime.

Verification

29.-(1) The meteorological station operators shall be required to carried out performance verification to ensure that meteorological instruments perform normal operations.

(2) The performance verification under

subregulation (1) shall follow manufacturer guideline and the Schedule to these Regulations.

PART IV
GENERAL PROVISIONS

General penalty

30. A person who contravenes any provision under these Regulations, where no specific penalty has been provided for under the Act, commits an offence and shall, upon conviction, be liable to a fine of not less than one million shillings but not exceeding three million shillings or to imprisonment for a term of not less than six months but not exceeding twelve months or to both.

Forms or certificates

31. The format of the form or certificate to be issued under these Regulations shall be determined by the Authority.

SCHEDULE

(Made under regulations 17(2), 19, 27 and 29(2))

Instrument Classes, Calibration, Maintenance and Verification Regime

	ITEM	CLASS A	CLASS B	CLASS C	CLASS D
Thermometer	Uncertainty	0.3 K	0.5 K	1.0 K	Greater than Class C or unknown
	Resolution	0.1 K	0.1 K	1 K	None or unknown
	Calibration Regime	Yearly	3 years	5 years	None or unknown
	Verification Regime	Every 6 months	Yearly	Yearly	None or unknown
	Maintenance Regime	Yearly	Yearly	Yearly	None or unknown
Hygrometer	Uncertainty	3 %RH	6 %RH	10 %RH	Greater than Class C or unknown
	Resolution	0.1 %RH	1 %RH	1 %RH	None or unknown
	Calibration Regime	Yearly	2 years	3 years	None or unknown
	Verification Regime	Every 6 months	Yearly	Yearly	None or unknown
	Maintenance Regime	Yearly	Yearly	Yearly	None or unknown
Barometer	Uncertainty	0.15 hPa	0.5 hPa	1.0 hPa	Greater than Class C or unknown

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	ITEM	CLASS A	CLASS B	CLASS C	CLASS D
	Resolution	0.1 hPa	0.1 hPa	1 hPa	None or unknown
	Calibration Regime	Yearly	2 years	3 years	None or unknown
	Verification Regime	Every 6 months	Yearly	Yearly	None or unknown
	Maintenance Regime	Yearly	Yearly	Yearly	None or unknown
Wind Anemometer	Uncertainty	Greater of 2 % or 0.1 m/s	Greater of 10 % or 0.5 m/s	Greater of 15 % or 1.0 m/s	Greater than Class C or unknown
	Resolution	0.1 m/s	0.5 m/s	1.0 m/s	None or unknown
	Calibration Regime	Yearly	2 years	5 years	None or unknown
	Verification Regime	Yearly	Yearly	3 years	None or unknown
	Maintenance Regime	Yearly	Yearly	3 years	None or unknown
Wind Vane	Uncertainty	5°	10°	15°	Greater than Class C or unknown
	Resolution	1°	1°	5°	None or unknown
	Calibration Regime	Yearly	2 years	5 years	None or unknown
	Verification Regime	Yearly	Yearly	3 years	None or unknown
	Maintenance Regime	Yearly	Yearly	3 years	None or unknown

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	ITEM	CLASS A	CLASS B	CLASS C	CLASS D
Rain recorder	Uncertainty	Greater of 2 % or 0.1 mm	Greater of 5 % or 0.2 mm	Greater of 10 % or 0.5 mm	Greater than Class C or unknown
	Resolution	0.1 mm	0.2 mm	0.5 mm	None or unknown
	Calibration Regime	Yearly	2 years	3 years	None or unknown
	Verification Regime	Yearly	Yearly	Yearly	None or unknown
	Maintenance Regime	Monthly	Every 6 months	Yearly	None or unknown
Rain gauge	Uncertainty	Greater of 5 % or 0.1 mm/h	Greater of 10 % or 0.5 mm/h	Greater of 15 % or 2 mm/h	Greater than Class C or unknown
	Resolution	0.01 mm/h	0.1 mm/h	1 mm/h	None or unknown
	Calibration Regime	Yearly	2 years	3 years	None or unknown
	Verification Regime	Yearly	Yearly	Yearly	None or unknown
	Maintenance Regime	Monthly	Every 6 months	Yearly	None or unknown
Sunshine duration	Uncertainty	120Wm^{-2}±20%	120Wm^{-2}±30%	120Wm^{-2}±50%	Greater than Class C or unknown
	Resolution	1 second	1 minute	1 minute	None or unknown
	Calibration Regime	Yearly	2 years	3 years	None or unknown

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	ITEM	CLASS A	CLASS B	CLASS C	CLASS D
	Verification Regime	Yearly	Yearly	Yearly	None or unknown
	Maintenance Regime	Monthly	Every 6 months	Yearly	None or unknown
Visibility (Meteorological Optical Range)	Uncertainty	Greater of 10 % or 20 m	Greater of 20 % or 50 m	Greater of 30 % or 100 m	Greater than Class C or unknown
	Resolution	1 m	1 m	10 m	None or unknown
	Calibration Regime	Yearly	Yearly	Yearly	None or unknown
	Verification Regime	Yearly	Yearly	Yearly	None or unknown
	Maintenance Regime	Monthly or on alert or error	Yearly or on alert or error	Yearly or on alert or error	None or unknown

Signature…… Date ……

Official Seal

Dodoma,
23th June, 2021

LEONARD M. CHAMURIHO
Minister for Work and Transport