



World Meteorological Organization
Organisation météorologique mondiale

Secrétariat

7 bis, avenue de la Paix – Case postale 2300 – CH 1211 Genève 2 – Suisse

Tél.: +41 (0) 22 730 81 11 – Fax: +41 (0) 22 730 81 81

wmo@wmo.int – www.wmo.int

Weather • Climate • Water
Temps • Climat • Eau

Our ref.: WDS/AN/AMF-Qualification

GENEVA, 28 January 2016

Annexes: 3 (Annexes II and III available in English only)

Subject: Aeronautical Meteorological Forecaster qualification compliance information

Dear Sir/Madam,

I wish to refer to several aeronautical meteorological matters as indicated below. In some of the WMO Members, the National Meteorological Services are not the primary Aviation Meteorological Service Provider (AMSP) for international civil aviation. If this is the case in your country, I would very much appreciate it if you, in your role as Permanent Representative of your country with WMO, could forward a copy of this letter to the head of the Aeronautical Meteorological Service Provider for their information and response.

This letter deals with the following matters:

- The entry into force of the WMO standard on required qualifications for Aeronautical Meteorological Forecasters on 1 December 2016 (see Section 5.1 of Volume I of WMO-No. 49);
- Request for updated information regarding the anticipated status of compliance with the Aeronautical Meteorological Forecasters qualification standard in your country by 1 December 2016.

1. Entry into force of the WMO standard on required qualifications of Aeronautical Meteorological Forecasters on 1 December 2016

You may recall that the Sixteenth World Meteorological Congress in 2011 set the competency and qualification requirements for aeronautical meteorological personnel involved in the provision of meteorological services to international air navigation (Resolution 53 (Cg-XVI)). This decision was subsequently included in the *WMO Technical Regulations*, Volume I (WMO-No. 49) as a standard requirement with the compliance date set to 1 December 2013 for competency, and to 1 December 2016 for the qualification standard. The International Civil Aviation Organization (ICAO) refers to these WMO qualification and competency provisions as requirements applicable to aeronautical meteorological personnel in its Contracting States.

Thus by 1 December 2016, the Meteorological Authorities of Member States should request the respective AMSPs to demonstrate compliance with the WMO qualification standard, i.e., that their Aeronautical Meteorological Forecasters (AMF) have successfully completed the Basic Instruction Package for Meteorologists (BIP-M), as defined in Appendix D to *WMO Technical Regulations*, Volume I (WMO-No. 49).

To: Permanent Representatives (or Directors of Meteorological or Hydrometeorological Services) of Members of WMO (PR-6885)

A successful demonstration of compliance would imply that national and (in some regions) regional regulatory and oversight bodies (i.e., national Meteorological Authority (MET Authority), or relevant national aviation regulator and, where appropriate, relevant regional bodies), would consult with the respective AMSPs to assure that their operational forecasting staff meets the AMF qualification requirements. In this regard, it should be noted that some Members may decide at the regulatory or organizational level to set a higher qualification level (e.g., university degree requirement), in which case, the compliance with the WMO standard would also be met.

Compliance with the BIP-M is typically ensured by the successful completion of a university degree-level course in meteorology. Other options are also possible and are further explored in the *Manual on the Implementation of Education and Training Standards in Meteorology and Hydrology*, Volume I (WMO-No. 1083, 2012 edition) available from the WMO website (www.wmo.int) via the library link. You may also recall that in a previous letter on this subject of 21 January 2015 (https://www.wmo.int/edistrib_exped/grp_prs/_en/2015/2015_01/2015-01-21-PR-6810-ETR-BIP-M_en.pdf), it was suggested that you contact the relevant universities and training centres in your country with regard to the confirmation of their meteorology courses meeting the WMO Basic Instruction Package for Meteorologists requirements.

As most AMSP will have AMF staff who have received their qualification over a wide period of time during which the BIP-M has also evolved, the Commission for Aeronautical Meteorology (CAeM) Expert Team on Education, Training and Competency (ET-ETC) has developed a decision flow chart (see Annex I) to assist AMSP to identify which version of the BIP-M should be referred to when reviewing the qualifications of their staff. The ET-ETC has also recently updated the Frequently Asked Questions (see Annex II) dealing with competency and qualification matters to facilitate your understanding of the assessment processes.

2. Request for updated information regarding the status of competency and qualification compliance in your country

The Seventeenth World Meteorological Congress in 2015 included Aeronautical Meteorology as one of the high priority areas for the coming financial period. To allow the WMO Secretariat to track progress and for the Executive Council to make decisions related to these high priority areas, it is necessary to conduct systematic compliance monitoring with Members and to report attained compliance level to the Executive Council. I am thus requesting you to provide an update on the anticipated state of compliance with the AMF qualification standard in your country on 1 December 2016 (i.e., the number of AMF expected to be compliant with the BIP-M requirements and the number of those who may not be compliant). It would be much appreciated if your reply could reach the WMO Secretariat via e-mail at aviation@wmo.int with a copy to detr@wmo.int before **30 April 2016**. To facilitate the gathering of such data, Annex III contains the most recent information we received from Members for these areas.

I wish to thank you for your continued support in promoting the Programmes and activities of WMO.

Yours faithfully,



(J. Lengoasa)
for the Secretary-General

BIP-M compliance flow chart for AMF



The Sixteenth World Meteorological Congress (Cg-XVI) in May 2011 incorporated¹ a set of learning outcomes known as the Basic Instruction Package for Meteorologists (BIP-M) into the WMO Technical Regulations². Employers of Aeronautical Meteorological Forecasters (AMF) who are providing meteorological services to international air navigation are required to show that, by 1 December 2016, their AMF comply with the BIP-M qualification requirements specified in Chapter 5 of Vol. I of WMO-No. 49, the WMO Technical Regulations.

Documentation of the AMF qualifications should be in accordance with the quality management system being used by the meteorological service provider.

The WMO Executive Council in 2012 further clarified that the version of the BIP-M to be used for determining compliance is given by the date in which personnel commenced their BIP-M training³.

The Expert Team on Education, Training and Competency of the WMO Commission for Aeronautical Meteorology has drawn up a decision aid to assist Members in complying with this requirement. By answering the Yes/No questions in the flow chart, the user will be pointed to the correct version of the BIP-M and subsequently to the actions that need to be taken to demonstrate compliance.

Shapes used in the flow chart

- *box with rounded corners*: start or end
- *rectangular box*: mandatory step in the chart
- *diamond*: decision point (Yes or No)

¹ Resolution 32 (Cg-XVI)

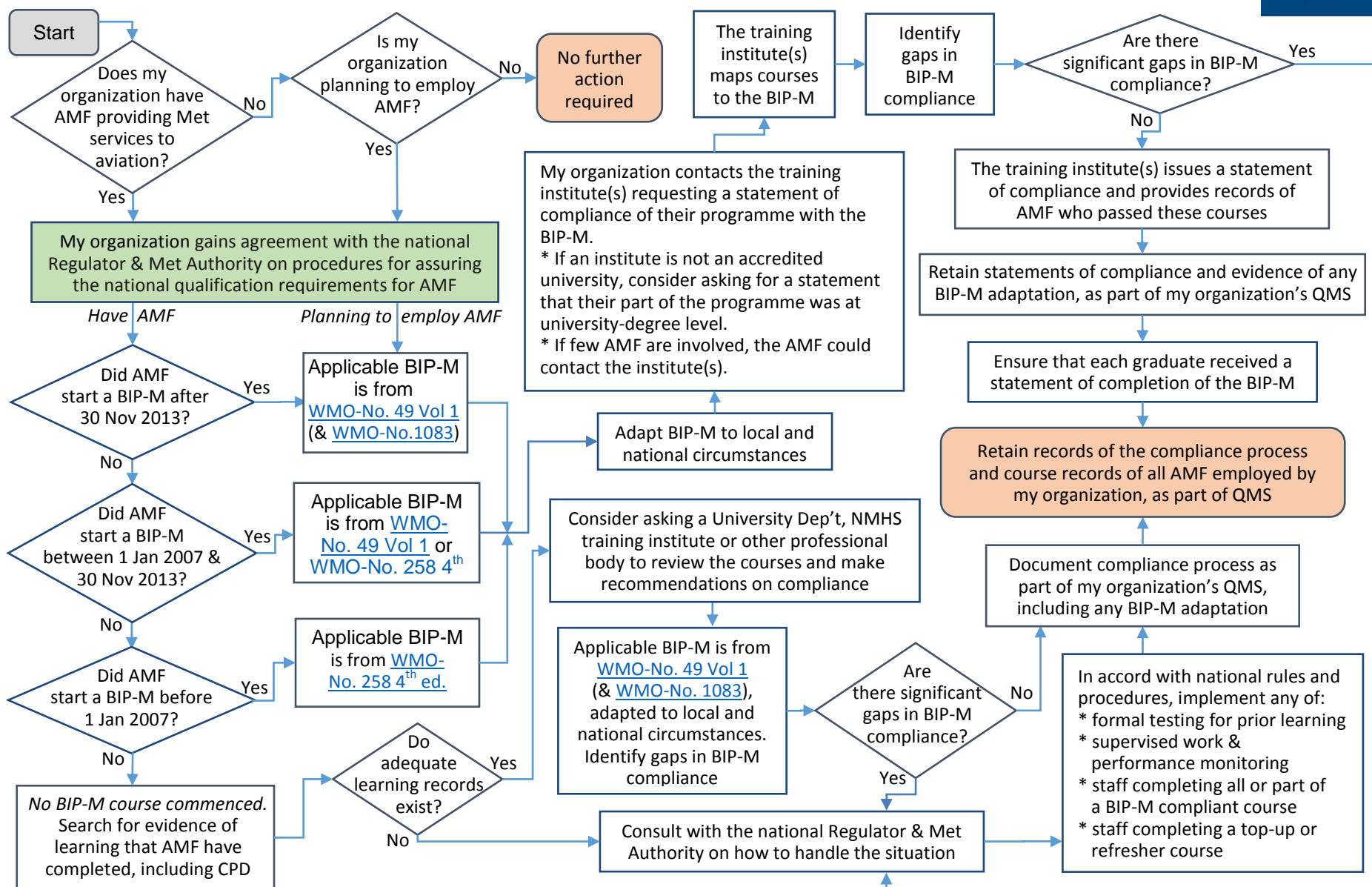
² WMO-No. 49 Technical Regulations Volume 1 – “General Meteorological Standards and Recommended Practices”, 2011 edition, updated 2012. A new edition is planned for 2015.

³ WMO-No. 1092: “Executive Council Sixty-fourth Session – Abridged Final Report with Resolutions”, paragraph 4.6.20

List of abbreviations and definitions used in the flow chart

AMF	Aeronautical Meteorological Forecaster(s)
BIP-M	Basic Instruction Package for Meteorologists
CPD	Continuous Professional Development
NMHS	National Meteorological and Hydrological Service
Met Authority	Meteorological Authority
QMS	Quality Management System
Regulator	The body responsible for regulating national aviation activities in accordance with ICAO provisions
University Dep’t	University Department
WMO-No.49 Vol 1 ...	WMO Technical Regulations Volume I – “General Meteorological Standards and Recommended Practices”
WMO-No.1083	WMO “Manual on the Implementation of Education and Training Standards in Meteorology and Hydrology”, 2012
WMO-No.258 4th ed	WMO “Guidelines for the Education and Training of Personnel in Meteorology and Operational Hydrology” fourth edition 2002

BIP-M compliance flow chart for AMF



Frequently Asked Questions addressing qualification and competency issues for Aeronautical Meteorological Personnel

1. What are competencies and who specifies the competencies required for a specific job?

Jobs are usually specified in terms of a job description that lists the tasks and responsibilities of the position. The associated competencies (or "competency standards") specify the knowledge, skills and behaviors required to perform that particular job. For example, an Aeronautical Meteorological Observer (AMO) must be able to observe and record aeronautical meteorological phenomena and parameters.

2. What will be the role of Permanent Representatives in setting academic qualifications?

The Aeronautical Meteorological Forecaster (AMF) academic qualification requirement is the successful completion of the relevant parts of the Basic Instruction Package for Meteorologists (BIP-M) as informed by consideration of the area and airspace of responsibility, the impact of meteorological phenomena and parameters on aviation operations, and compliance with aviation user requirements, international regulations, local procedures and priorities. It is the responsibility of each national Meteorological Authority (MET Authority), national aviation regulator (in many countries the regulator also performs the Meteorological Authority role) and where appropriate other regional bodies to consult with the Aviation Meteorological Service Provider (AMSP) to agree and assure that this requirement is being met. Some AMSP may decide, at the organizational level, to set a higher qualification level or a MET Authority may decide to impose a similarly higher qualification level. **Only in instances where a WMO Meteorologist classification requirement is set or imposed should the relevant WMO Permanent Representative(s) also be consulted.**

3. Who can certify that personnel are competent?

It is up to each aviation meteorological service provider, based on their national regulations and organizational procedures, to determine who can certify that personnel are competent. It is important that the processes employed are fully integrated into an organization's QMS and personnel development strategy, are carefully documented, and that there is clear evidence that the process is ongoing. For any personnel unable to demonstrate that they satisfy the competencies, remedial action such as coaching, mentoring or further training must be taken.

Experienced personnel should be selected and then trained to assess competency. The Competency Assessment Toolkit (CAT) developed by the CAeM Task Team (TT-CAT) will help with this task.

4. What records must be kept to show that personnel have the required competencies and qualifications?

When evidence of compliance with the competency Standards is requested from an aviation meteorological service provider, the provider will be expected to be able to demonstrate that competency Standards have been adapted to local and national circumstances and that all personnel:

- (i) Satisfy the relevant requirements of the competency Standards; and
- (ii) For AMFs, have also successfully completed the requirements of the BIP-M taking into account the AMF competency Standards conditions (see answer to question 8 below), in compliance with national/regional academic qualification requirements. Members who have already been audited have advised that the process is thorough. The audit teams have wanted to see comprehensive documentation and have asked in-depth questions about the Members' processes and procedures.

5. What will happen if an aviation meteorological service provider was unable to demonstrate by 1 December 2013 that their personnel are able to satisfy the competency Standards?

A non-compliance issue should be raised against the associated ICAO requirement (i.e. ICAO Annex 3, paragraph 2.1.5). This means that the designated aviation MET service provider e.g. the NMS, should notify their national regulator that conformance against the Standard has not yet been achieved. This advice should be provided along with a roadmap/plan to demonstrate how/when conformance will be achieved in the future. It is then the responsibility of the regulator to register a 2.1.5 non-compliance issue with ICAO or (less likely) to seek an alternative AMSP who can satisfy the Standard.

The process is the same for registering any non-compliance issue including QMS implementation (deadline was November 2012) and it should be noted that:

- (i) Failure to notify the national regulator renders the aviation MET service provider legally liable for any incidents that occur and that are attributable to a poor aviation MET forecast and/or poor MET observation;
- (ii) Continued non-compliance (even when notified) will significantly weaken the aviation MET service provider's likelihood of continuing to retain AMSP designation.

6. How frequently must the competencies of personnel be tested?

The Standards do not specify how frequently the competency of personnel should be assessed. This frequency should be determined by review processes of the QMS and other factors such as staff recruitment, changes in operating systems, products and services and by the results of earlier competency assessments. However, a review cycle of, at most, 3-5 years is strongly suggested as part of an overall quality management and risk management approach.

7. Is funding available to develop the competencies?

Members should not expect WMO to provide funding assistance. AMSP should endeavor to negotiate with the users and authorities concerned an agreeable part of the aviation-specific education and training cost. There are no WMO regular budget funds allocated to assist Members with these actions although, through the CAeM Expert Team on Education, Training and Competency (ET-ETC), guidance resources are being made available, together with workshops funded from extrabudgetary resources.

8. What steps should be taken now to ensure that personnel providing meteorological services for international air navigation have the required competencies and qualifications?

By 1 December 2016 Aviation Meteorological Service Providers (AMSP), taking into consideration the area and airspace of responsibility, the impact of meteorological phenomena and parameters on aviation operations, aviation user requirements, international regulations, local procedures and priorities, shall ensure that their Aeronautical Meteorological Forecasters

have successfully completed the Basic Instruction Package for Meteorologists, as defined in Appendix D of the *WMO Technical Regulations* Vol. 1 (WMO-No. 49).

Note that the deadline for AMSP to implement competency Standards for AMP passed in 2013. Guidance material will continue to be available on the CAeM Education and Training website <http://www.caem.wmo.int/moodle/>.

WORLD METEOROLOGICAL ORGANIZATION
=====

WDS/AN/AMF-Qualification, ANNEX III

**Status of AMF personnel anticipated to be compliant with / not compliant with the BIP-M requirements on 1 December 2016
(Data from ETR survey in late 2013)**

Country	Anticipated number of AMF who will be compliant with the BIP-M requirement on 1 December 2016	Anticipated number of AMF who will not be compliant with the BIP-M requirement on 1 December 2016	Total AMF
Afghanistan	2	4	6
Albania			
Algeria			
Angola			
Antigua and Barbuda	8	1	9
Argentina	9	54	63
Armenia			
Australia	166	0	166
Austria			
Azerbaijan	45	30	75
Bahamas			
Bahrain	16	0	16
Bangladesh			
Barbados	2	5	7
Belarus			
Belgium	3	0	3
Belize	4	3	7
Benin	1	0	1
Bhutan			
Bolivia, Plurinational State of			
Bosnia and Herzegovina		0	0
Botswana			
Brazil			
British Caribbean Territories	5	4	9
Brunei Darussalam			
Bulgaria			
Burkina Faso	30		30
Burundi	5	6	11
Cambodia			
Cameroon		0	0

ANNEX III, p. 2

Canada	86	0	86
Cabo Verde	10	0	10
Central African Republic		0	0
Chad			
Chile	32	8	40
China	800	0	800
Colombia	1	5	6
Comoros			
Congo	7	0	7
Cook Islands			
Costa Rica	5	5	10
Cote d'Ivoire	1	4	5
Croatia			
Cuba			
Curaçao and Sint Maarten			
Cyprus			
Czech Republic			
Democratic People's Republic of Korea			
Democratic Republic of the Congo			
Denmark			
Djibouti			
Dominica	0	2	2
Dominican Republic			
Ecuador			
Egypt	33	0	33
El Salvador			
Equatorial Guinea			
Eritrea			
Estonia	6	2	8
Ethiopia	9	0	9
Fiji	11	0	11
Finland	40	0	40
France	300	0	300
French Polynesia			
Gabon	1	3	4
Gambia	5	2	7
Georgia			
Germany	200	0	200
Ghana	10	5	15
Greece			
Guatemala	3	2	5
Guinea	14	12	26
Guinea Bissau	4	0	4

Guyana			
Haiti			
Honduras	4	11	15
Hong Kong, China	14	0	14
Hungary	10	0	10
Iceland			
India	450	0	450
Indonesia	151	68	219
Iran, Islamic Republic of	9	0	9
Iraq	30	0	30
Ireland	8	0	8
Israel	7	2	9
Italy			
Jamaica			
Japan			
Jordan			
Kazakhstan			
Kenya	40	0	40
Kiribati	1	4	5
Kuwait	12	0	12
Kyrgyzstan			
Lao People's Democratic Republic	1	3	4
Latvia	5	2	7
Lebanon			
Lesotho	1	4	5
Liberia	1	10	11
Libya	23	0	23
Lithuania	8	0	8
Luxembourg	9	0	9
Macao, China			
Madagascar	4	11	15
Malawi	4	0	4
Malaysia	59	0	59
Maldives			
Mali	0	25	25
Malta			
Mauritania			
Mauritius	12	0	12
Mexico			
Micronesia, Federated States of			
Monaco			
Mongolia			
Montenegro		0	0
Morocco			

ANNEX III, p. 4

Mozambique	14	4	18
Myanmar	3	7	10
Namibia	6	6	12
Nepal			
Netherlands	34	1	35
New Caledonia			
New Zealand	15	0	15
Nicaragua	3	0	3
Niger			
Nigeria			
Niue		0	0
Norway			
Oman	10	4	14
Pakistan	32	8	40
Palestinian Authority			
Panama			
Papua New Guinea	5	5	10
Paraguay			
Peru		0	0
Philippines	32	0	32
Poland	50	0	50
Portugal	8	0	8
Qatar	15	10	25
Republic of Korea	28	0	28
Republic of Moldova		0	0
Romania	26	0	26
Russian Federation	934	77	1001
Rwanda			
Saint Kitts and Nevis			
Saint Lucia	9	2	11
Saint Vincent and the Grenadines			
Samoa	1	0	1
Sao Tome and Principe	3	4	7
Saudi Arabia			
Senegal	7	0	7
Serbia			
Seychelles			
Sierra Leone	0	1	1
Singapore	20	0	20
Slovakia	14	5	19
Slovenia			
Solomon Islands	0	2	2
Somalia			
South Africa	30	0	30
South Sudan	7	13	20

Spain	120	0	120
Sri Lanka	10	0	10
Sudan	6	13	19
Suriname	1	5	6
Swaziland			
Sweden	70	0	70
Switzerland	51	0	51
Syrian Arab Republic			
Tajikistan			
Thailand	14	4	18
The former Yugoslav Republic of Macedonia			
Timor-Leste			
Togo			
Tonga	0	2	2
Trinidad and Tobago			
Tunisia	8	0	8
Turkey	320	0	320
Turkmenistan			
Tuvalu	0	4	4
Uganda	2	4	6
Ukraine			
United Arab Emirates			
United Kingdom of Great Britain and Northern Ireland	100	0	100
United Republic of Tanzania			
United States of America	2200	0	2200
Uruguay	2	8	10
Uzbekistan	106	106	212
Vanuatu	3	2	5
Venezuela, Bolivarian Republic of			
Viet Nam			
Yemen	17	9	26
Zambia	4	0	4
Zimbabwe	56	0	56