Graphical SIGMET Monitor (GSM)

User Guide

CIVIL AVIATION AUTHORITY
OF NEW ZEALAND
Te Mana Rererangi Tūmatanui o Aotearoa

1 Introduction

1.1 Graphical representation of SIGMETs will be provided in addition to the text-based (textual) messages sent via the AFTN from 31 July 2015. The graphical presentation is provided in a product called the Graphical SIGMET Monitor (GSM) and is effectively a monitoring product intended for situational awareness.

2 Product Overview

2.1 Textual SIGMETs are issued as separate SIGMETs for each hazardous weather phenomenon, whether observed or forecast. However, a GSM will display all current SIGMETs in a particular FIR. A separate GSM will be issued for the New Zealand FIR (NZZC) and the Auckland Oceanic FIR (NZZO).

2.2 The FIR boundaries will be displayed in each GSM. Each GSM will also show 5° spacing latitude and longitude reference lines.

2.3 GSMs will not be amended. A new GSM will be issued each time a new textual SIGMET is issued or cancelled. So there will never be more than one GSM valid for each FIR at any particular time.

2.4 The validity period of each GSM will be displayed in the legend box of the GSM (refer to the examples in Appendix 1). This will correspond to the earliest start time for the SIGMETs displayed and extend to the latest end time for the SIGMETs displayed.

For example, if the beginning of the validity period for the earliest SIGMET displayed is 0400Z and the end of the validity period for the latest SIGMET is 1100Z, the GSM validity will be 0400Z to 1100Z. This is the period during which the information in a GSM is valid for passing to pilots by an air traffic controller.

2.5 Each SIGMET displayed in a GSM will include the specific validity period for that particular SIGMET.

2.6 Each GSM will include hazardous weather phenomena displayed in areas (polygons) using established meteorological symbols and movement (direction arrows and speed). In order to assist in decoding the symbols, there is a key included with each GSM (refer to the examples and decode table in Appendix 1).

2.7 Textual SIGMETs concerning volcanic ash and tropical cyclones will not be displayed in graphical detail in GSMs. If a volcano or a tropical cyclone is located in either the NZZC or NZZO GSM, the location of the volcano or tropical cyclone will be shown at the actual location in the GSM (refer to the examples in Appendix 1). However, if a volcano is located outside of NZZC or NZZO, but volcanic ash from the volcano has entered the FIR, or is expected to do so, this will be indicated in a separate box displayed on the GSM (refer to the examples in Appendix 1).

2.8 SIGMETs are not displayed in the NZZO GSM south of 60S, the southern limit of the NZZO GSM product. However, textual SIGMETs will be provided for NZZO south of 60S (to South Pole).

2.9 The boundary of NZZC is shown on the NZZO GSM, but SIGMETs for NZZC are not displayed within this area of the NZZO GSM. The graphical display of SIGMETs in NZZC is restricted to the NZZC GSM product.

2.10 Note that if there is a large area of hazardous weather across both NZZC and NZZO, the separate SIGMETs for each FIR will be depicted on respective GSMs (See example in Appendix 1).

3 ATS Radio Transmission of SIGMET Information

3.1 The voice transmission of SIGMET information to general aviation aircraft operating domestically in the New Zealand FIR (NZZC) should be made using information from the Graphical SIGMET Monitor in the first instance. The location of the hazardous weather phenomena should be described in a general geographical sense from the location of the affected area set out on the GSM. This description of the affected area does not need to be detailed.

3.2 The following are examples of what ATS might pass by voice transmission to an aircraft operating near or toward the affected areas (refer GSM for NZZC in Appendix 1):

- "SIGMET 1 valid 1928 to 2328, severe icing, FL110 to FL210, Kawhia-Taupo-Whakatane to Northland, moving NE 10"
- "SIGMET 6 valid 1938 to 2338, severe turbulence, surface to FL120, south of Kaikoura, north of Dunedin, east of the Southern Alps, intensifying".

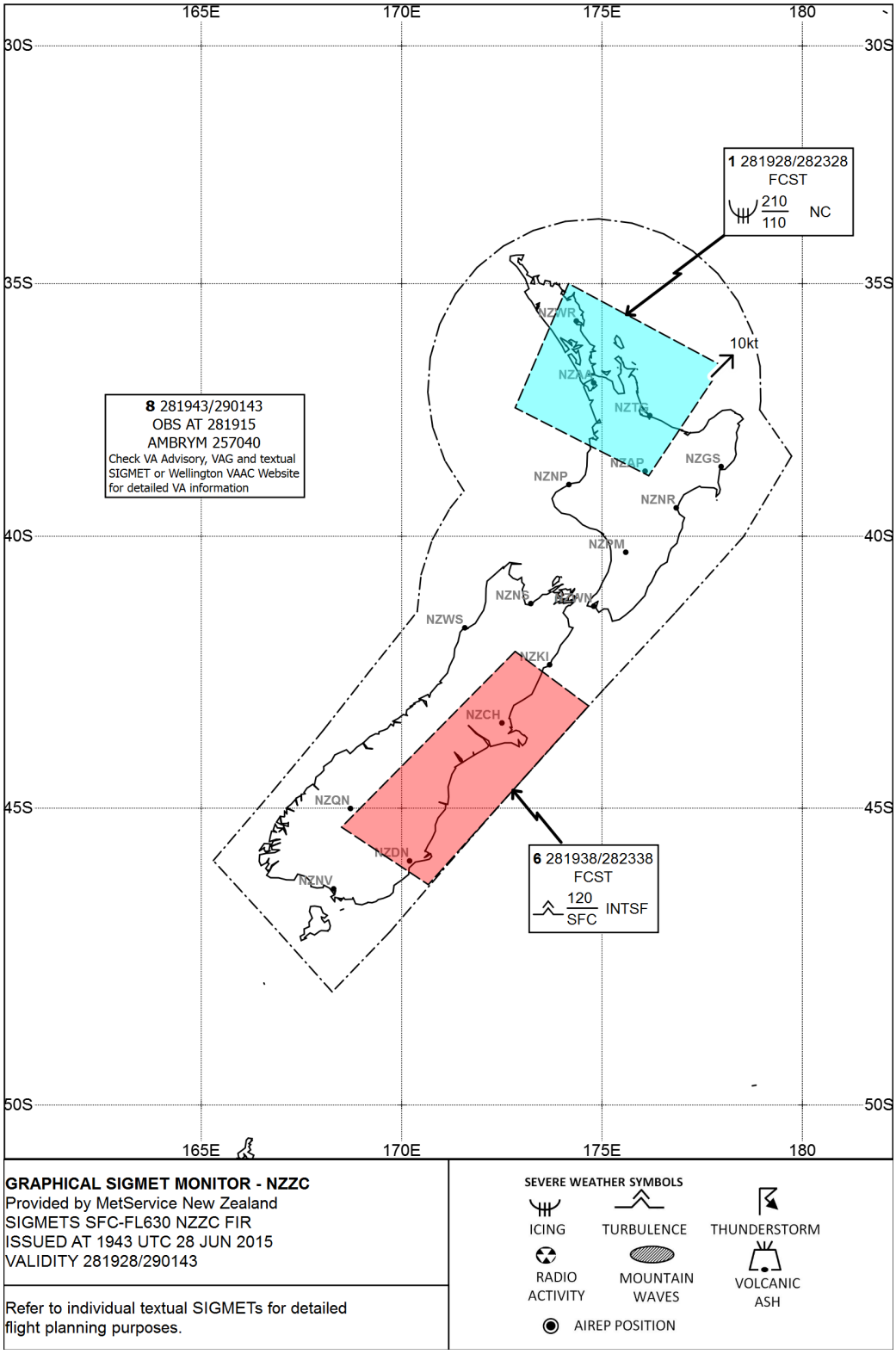
3.3 Should a pilot operating domestically in the New Zealand FIR require the exact location of the hazardous weather phenomena covered in a SIGMET, ATS may pass that information using the standard textual SIGMET which contains the latitude and longitude co-ordinates describing the area (polygon) of severe weather phenomena.

3.4 Note that the voice transmission of SIGMET information to international aircraft operating in either of the New Zealand FIR (NZZC) or the Auckland Oceanic FIR (NZZO) should only be made using the standard textual SIGMET – relaying the latitude and longitude co-ordinates describing the area (polygon) of severe weather phenomena.

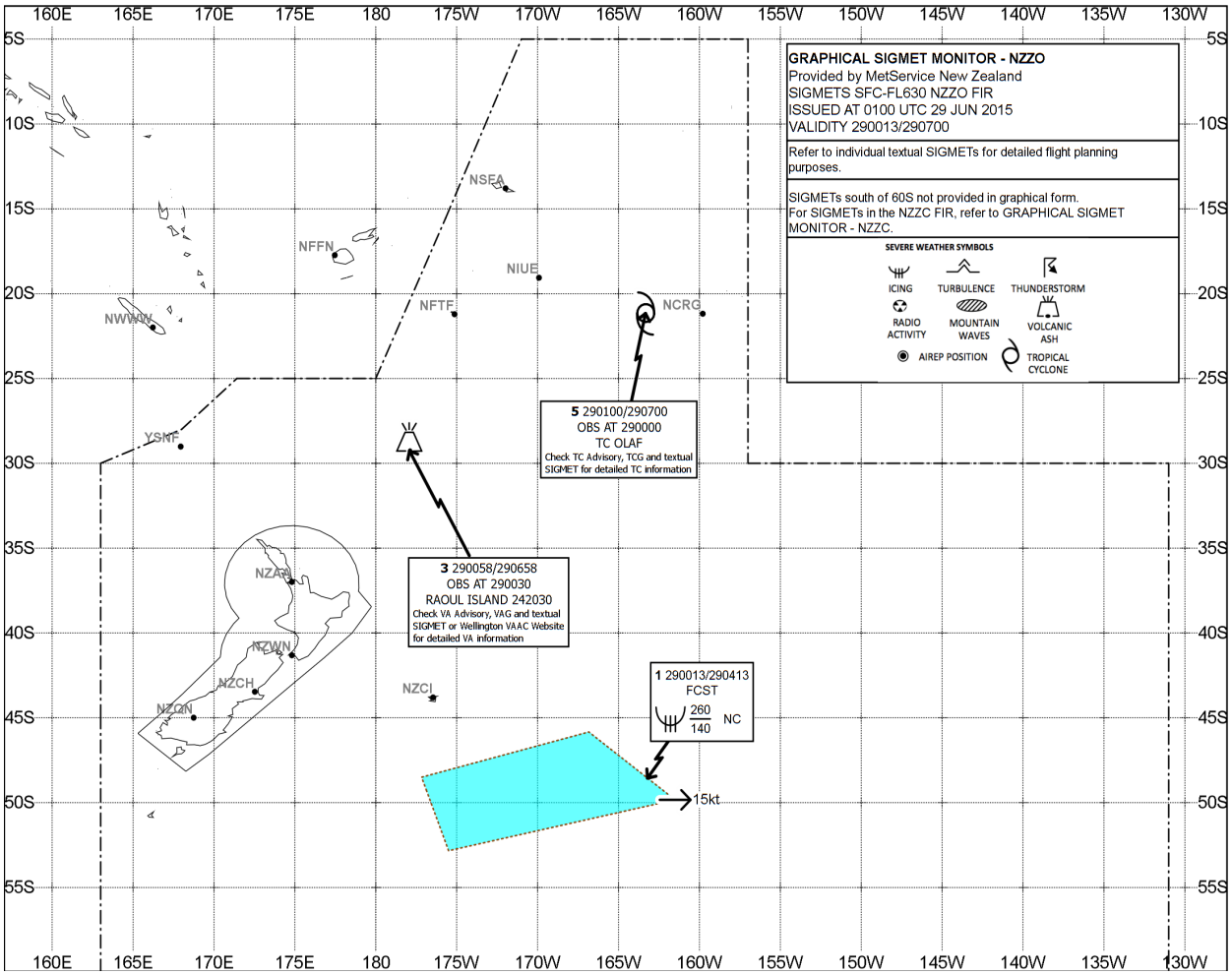
Appendix 1 – Guidance and Interpretation Notes

1. GSM Examples

1.1 GSM for NZZC



1.2 GSM for NZZO



1.3 Decode Tables

A legend with the weather symbols is included on each GSM to assist in the interpretation of the graphic.

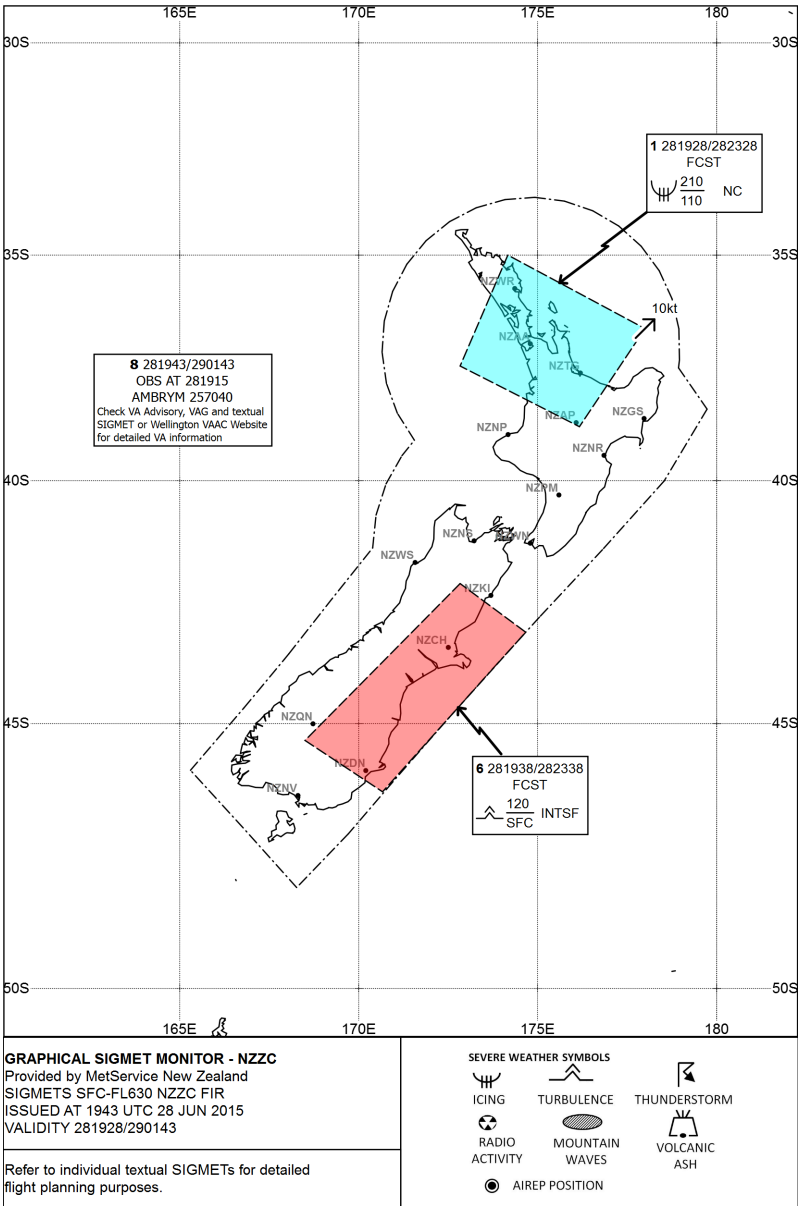
Symbol	Description	Symbol	Description
	Icing		Mountain Waves
	Turbulence		Volcanic Ash
	Thunderstorm		Tropical Cyclone
	Radioactive material		AIREP Position
	Zaggy arrow pointing from the SIGMET information box to the polygon		
10kt	Indicates the direction and speed of movement of the phenomenon. The absence of an arrow indicates the phenomenon is stationary.		
180 130	Indicates the upper and lower levels of the weather phenomenon expressed in flight levels at and above FL100, and in feet between the SFC and 10,000ft .		

The terms used to describe a change in intensity of weather phenomena in the GSM is the same as their meaning and usage in the textual SIGMETs, i.e., INTSF (Intensifying), NC (No change), WKN (Weakening).

2. NZZC GSM - Explanation and Decode

2.1 Example - NZZC

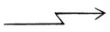
An explanation and decode of the information displayed is given for the following example. The numbering in the explanation and decode is the same as the numbering of each SIGMET displayed in the GSM.



This example shows that SIGMETs numbered 1, 6 and 8 are the current valid SIGMETs in the NZZC FIR. SIGMETs numbered 2 – 5 and 7 have expired or were cancellation messages.

2.2 Decode and ATC Transmission of NZZC GSM Example

Information or symbol	Description
1 281928/282328	SIGMET number 1, valid from 1928 to 2328 UTC on the 28th day of the month.
FCST	This SIGMET provides a forecast (FCST) of the hazardous weather phenomenon listed. In this case it is severe icing.
	Severe icing symbol.
210 110	The top of the severe icing is forecast to be FL210 and the base FL110.
NC	No change (NC) in intensity is expected during the validity of the SIGMET.
 10kt	The area (polygon) of severe icing is forecast to move northeast (NE) at 10 knots during the validity of the SIGMET.
	A "zaggy" arrow points from the information box to the area (polygon) of severe icing.
Transmission to domestic traffic:	SIGMET 1 valid 1928 to 2328, Severe icing, FL110 to FL210, Kawhia-Taupo-Whakatane to Northland, moving NE 10 kt.

Information or symbol	Description
6 281938/282338	SIGMET number 6, valid from 1938 to 2338 UTC on the 28th day of the month.
FCST	This SIGMET provides a forecast (FCST) of the hazardous weather phenomenon listed. In this case it is severe turbulence.
	Severe turbulence symbol.
120 SFC	The top of the severe turbulence is forecast to be FL120 and the base at the SFC.
INTSF	Intensifying (INTSF). The phenomenon is expected to intensify during the validity period of the SIGMET.
	A "zaggy" arrow points from the information box to the area (polygon) of severe turbulence.
Transmission to domestic traffic:	SIGMET 6 valid 1938 to 2338, severe turbulence, surface to FL120, south of Kaikoura, north of Dunedin, east of the Southern Alps, intensifying.

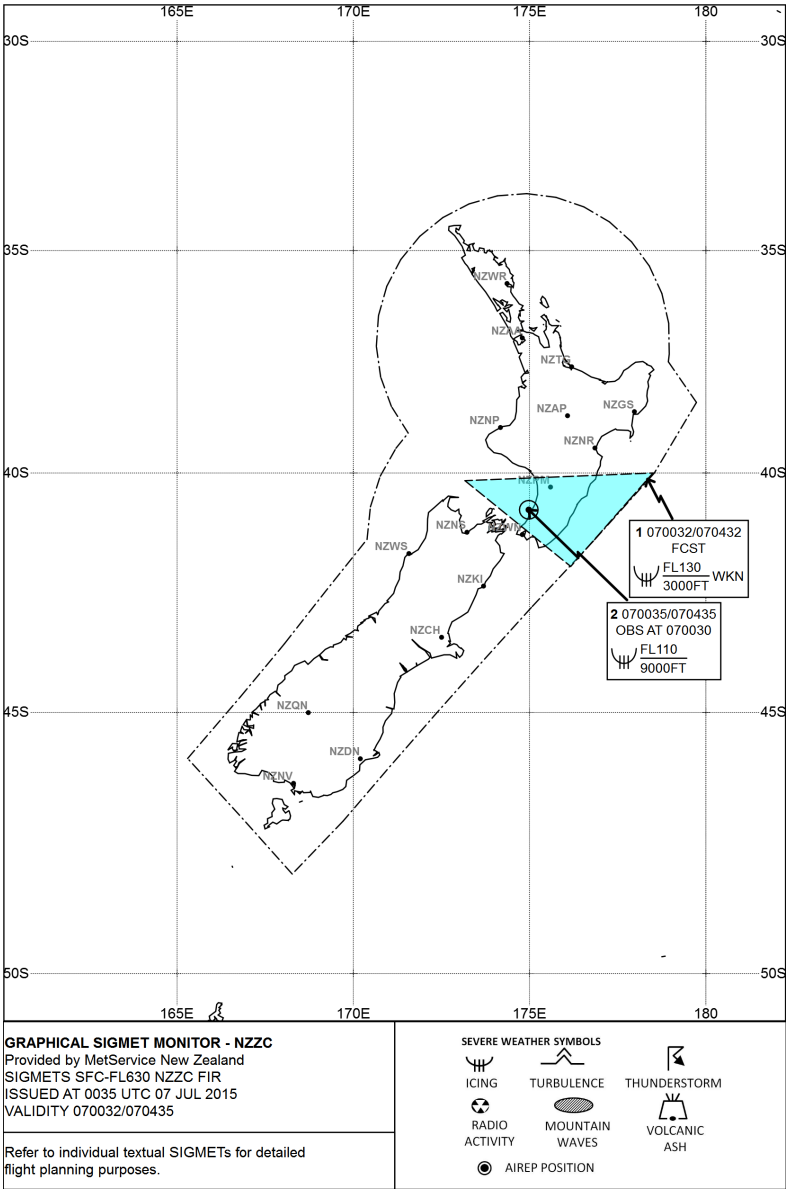
Information or symbol	Description
8 281943/290143	SIGMET number 8, valid from 1943 to 0143 UTC on the 28th and 29th day of the month.
OBS AT 281915	An observation (OBS) of volcanic ash made at 1915 UTC, on the 28th day of the month.
AMBRYM 257040	A volcano named AMBRYM, with a volcano number 257040[1], has erupted in a location outside the NZZC FIR, but volcanic ash from the volcano is affecting the NZZC FIR, i.e., ash has drifted into or over the FIR.
Check VA Advisory, VAG and textual SIGMET or Wellington VAAC website for detailed VA information	The note indicates that users should refer to the information listed for more detailed information about the volcano and the associated volcanic ash. Note that a VAG is a Volcanic Ash Graphic issued by the Wellington Volcanic Ash Advisory Centre (VAAC), and is a completely separate graphic with a different layout to a GSM.
Transmission to domestic traffic:	Transmit Volcanic Ash Advisory information only to outbound international traffic.

[1] The Global Volcanism Program of the Smithsonian Institution maintains the *Volcanoes of the World* database, with each volcano in the world assigned a unique number. The number for the Ambrym volcano is 257040

2.3 Decode of NZZC GSM Information Box (Lower panels)

Information	Description
GRAPHICAL SIGMET MONITOR – NZZC	This indicates the graphical SIGMET MONITOR is for the New Zealand FIR (NZZC).
Provided by MetService New Zealand	The GSM is provided by MetService New Zealand.
SIGMETS SFC-FL630 NZZC FIR	The GSM includes SIGMET information for the airspace from the surface (SFC) to FL630 for the New Zealand FIR (NZZC).
ISSUED AT 1943 UTC 28 JUN 2015	The GSM was issued at 1943 UTC on the 28th of June 2015.
VALIDITY 281928/290143	The validity of the GSM is from 1928 to 0143 UTC on 28/29 June 2015. This indicates the earliest commencement time for a SIGMET in the GSM (281938 UTC) and the latest end time for a SIGMET in the GSM (290143 UTC).
Refer to individual textual SIGMETs for detailed flight planning purposes	This note is intended to remind pilots that the textual SIGMETs are intended for flight planning purposes, whereas the GSM product is intended to provide situational awareness, and for use by air traffic controllers to convey SIGMET information to pilots in flight.

2.4 Example – NZZC with an Air Report Displayed



2.5 Decode of NZZC GSM Example (with Air Report Displayed)

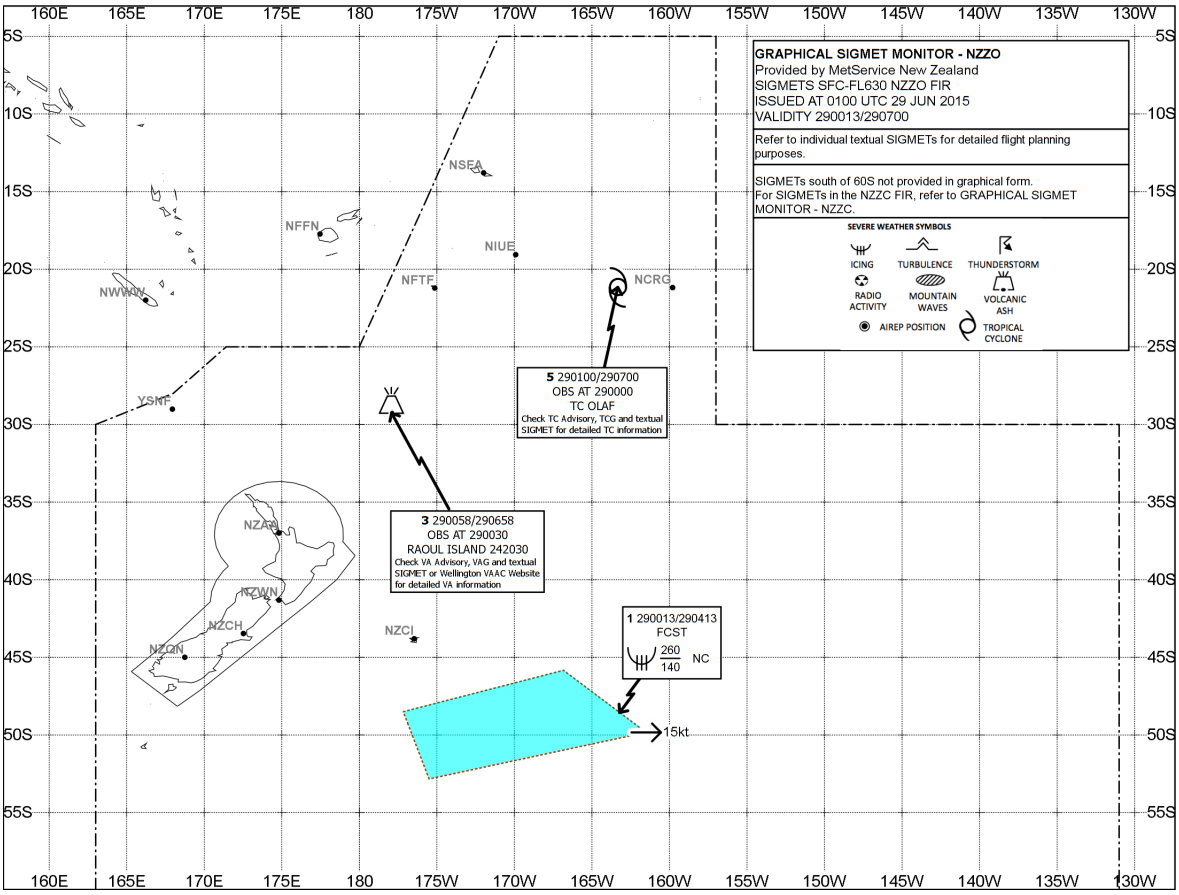
Information or symbol	Description
1 070032/070432	SIGMET number 1, valid from 0032 to 0432 UTC on the 7th day of the month.
FCST	This SIGMET provides a forecast (FCST) of the hazardous weather phenomenon listed. In this case it is severe icing.
	Severe icing symbol.
130 3000FT	The top of the severe icing is forecast to be FL130 and the base 3000FT.
WKN	The intensity is expected to weaken (WKN) during the validity of the SIGMET.
	A "zaggy" arrow points from the information box to the area (polygon) of severe icing.
Transmission to domestic traffic:	SIGMET 1 valid 0032 to 0432, Severe icing, 3000ft to FL130 , South of Palmerston North to Cook Strait, stationary.

Information or symbol	Description
2 070035/070435	SIGMET number 2, valid from 0035 to 0435 UTC on the 7th day of the month.
OBS AT 070030	An observation (OBS) (Air Report) of severe icing made at 0030 UTC, on the 7th day of the month.
	Severe icing symbol.
110 9000FT	The top of the severe icing was observed at FL110 and the base at 9000FT.
	A "zaggy" arrow points from the information box to the location of the observation (near Paraparaumu/Otaki).
Transmission to domestic traffic:	SIGMET 2 valid 0035 to 0435, Severe icing observed at 0030 overhead Paraparaumu 9000ft to FL110.

3. NZZO GSM - Explanation and Decode

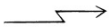
3.1 Example - NZZO

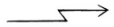
An explanation and decode of the information displayed is given for the following example. The numbering in the explanation and decode is the same as the numbering of each SIGMET displayed in the GSM.



This example shows that SIGMETs numbered 2, 4 and 5 are the current valid SIGMETs in the NZZO FIR. SIGMETs numbered 1 and 3 have been cancelled.

3.2 Decode – NZZO

Information or symbol	Description
1 290013/290413	SIGMET number 1, valid from 0013 to 0413 UTC on the 29th day of the month.
FCST	This SIGMET provides a forecast (FCST) of the hazardous weather phenomenon listed. In this case it is severe icing.
	Severe icing symbol.
260 140	The top of the severe icing is forecast to be FL260 and the base FL140.
NC	No change (NC) in intensity is expected during the validity of the SIGMET.
 15kt	The area (polygon) of severe icing is forecast to move east (E) at 15 knots during the validity of the SIGMET.
	A “zaggy” arrow points from the information box to the area (polygon) of severe icing.

Information or symbol	Description
3 290058/290658	SIGMET number 3, valid from 0058 to 0658 UTC on the 29th day of the month.
OBS at 290030	An observation (OBS) (air report) of volcanic ash made at 0030 UTC, on the 29th day of the month.
RAOUL ISLAND 242030	The volcano named RAOUL ISLAND, with a volcano number 242030[1], has erupted and is producing volcanic ash.
Check VA Advisory, VAG and textual SIGMET or Wellington VAAC website for detailed VA information	The note indicates that users should refer to the information listed for more detailed information about the volcano and associated volcanic ash. Note that a VAG is a Volcanic Ash Graphic issued by the Wellington Volcanic Ash Advisory Centre (VAAC), and is a completely separate graphic with a different layout to a GSM.
	A "zaggy" arrow points from the information box to the location of the volcano (Raoul Island).

[1] The Global Volcanism Program of the Smithsonian Institution maintains a *Volcanoes of the World* database, with each volcano in the world assigned a unique number. The number for Raoul Island is 242030.

Information or symbol	Description
5 290100/290700	SIGMET number 5, valid from 0100 to 0700 UTC on the 29th day of the month.
OBS AT 290000	The hazardous phenomenon (tropical cyclone) was observed (air report) at 0000 UTC on the 29th day of the month.
	Tropical cyclone symbol is shown at the location where it was observed.
TC OLAF	The name of the tropical cyclone is OLAF.
Check TC Advisory, TCG and textual SIGMET for detailed TC information	The note indicates that users should refer to the information listed for more detailed information about the tropical cyclone. Note that a TCG is a Tropical Cyclone Graphic issued by the Nadi (Fiji) Tropical Cyclone Advisory Centre (TCAC), and is a completely separate graphic with a different layout to a GSM.
	A "zaggy" arrow points from the information box to the location of the tropical cyclone.

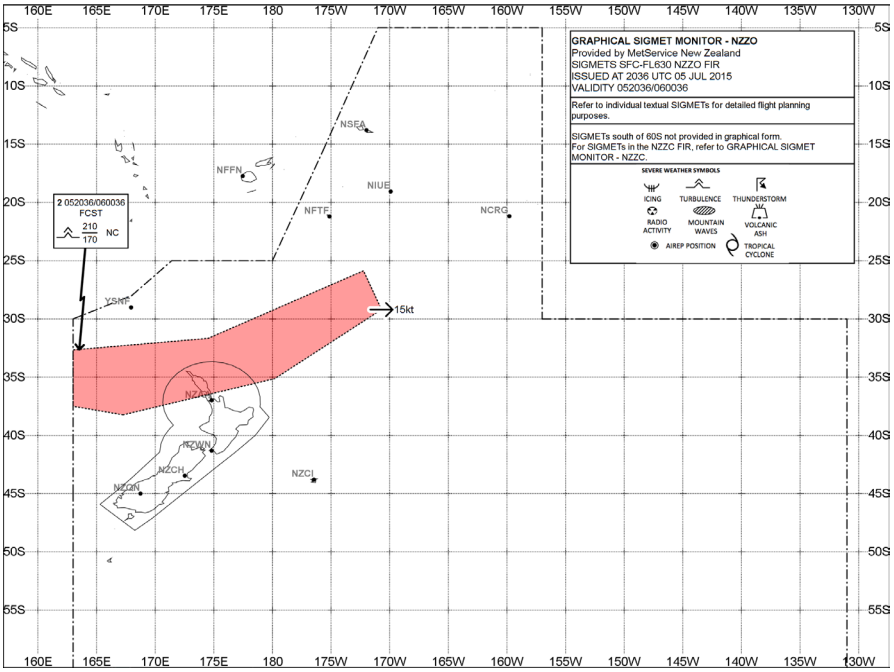
3.3 Decode of NZZO GSM Information Box (top right of the GSM Example)

Information	Description
GRAPHICAL SIGMET MONITOR – NZZO	This indicates the graphical SIGMET MONITOR is for the Auckland Oceanic FIR (NZZO).
Provided by MetService New Zealand	The GSM is provided by MetService New Zealand.
SIGMETS SFC-FL630 NZZO FIR	The GSM includes SIGMET information for the airspace from the surface (SFC) to FL630 for the Auckland Oceanic FIR (NZZO).
ISSUED AT 0100 UTC 29 JUNE 2015	The GSM was issued at 0100 UTC on 29 June 2015.
VALIDITY 290013/290700	The validity of the GSM is from 0013 to 0700 UTC on 29 June 2015. This indicates the earliest commencement time for a SIGMET in the GSM (290013) and the latest end time for a SIGMET in the GSM (290700).
Refer to individual textual SIGMETs for detailed flight planning purposes	This note is intended to remind pilots that the textual SIGMETs are intended for flight planning purposes, whereas the GSM product is intended to provide situational awareness, and for use by air traffic controllers in convey SIGMET information to pilots in flight.

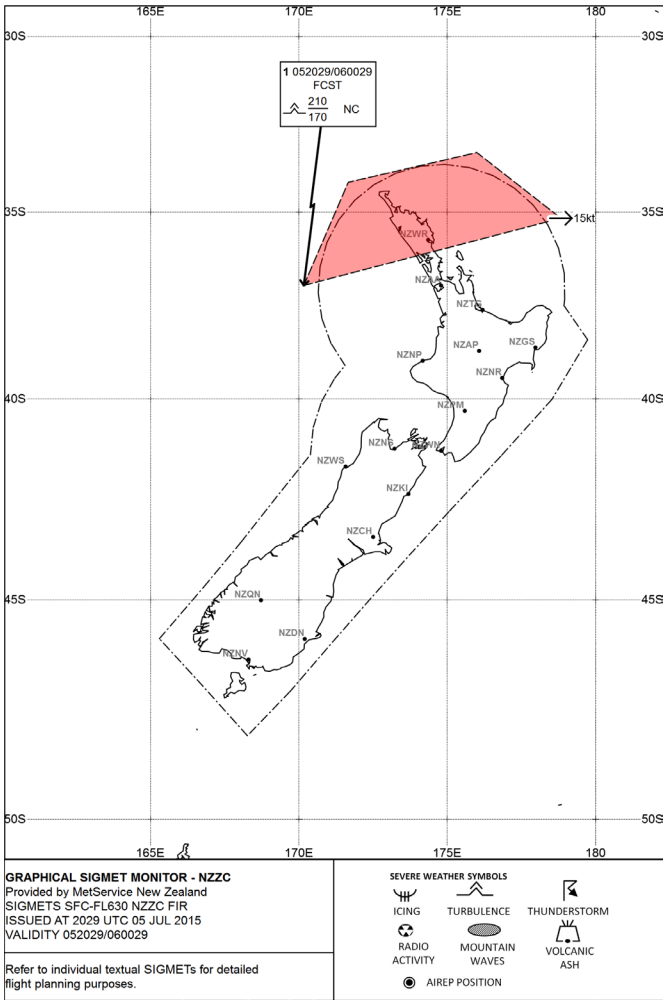
SIGMETs south of 60S not provided in graphical form. For SIGMETs in the NZZC FIR, refer to GRAPHICAL SIGMET MONITOR - NZZC	This indicates that SIGMETs for the area south of 60S are not displayed in graphical form, but are still provided in textual form. The boundary of the New Zealand FIR (NZZC) is shown on this GSM, but SIGMETs are not displayed in the NZZC FIR part of the GSM. Graphical presentation of SIGMETs in the NZZC FIR is only displayed on a separate GSM for the NZZC FIR.

4. Widespread phenomena depiction in NZZO and NZZC GSMs

NZZO GSM



NZZC GSM



4.1 Decode – NZZO

Information or symbol	Description
2 052036/060036	SIGMET number 2, valid from 2036 to 0036 UTC on the 5th/6th day of the month.
FCST	This SIGMET provides a forecast (FCST) of the hazardous weather phenomenon listed. In this case it is severe turbulence.
	Severe turbulence symbol.
210 170	The top of the severe turbulence is forecast to be FL210 and the base FL170.
NC	No change (NC) in intensity is expected during the validity of the SIGMET.
	A "zaggy" arrow points from the information box to the area (polygon) of severe turbulence.

4.2 Decode – NZZC

Information or symbol	Description
1 052029/060029	SIGMET number 1, valid from 2029 to 0029 UTC on the 5th/6th day of the month.
FCST	This SIGMET provides a forecast (FCST) of the hazardous weather phenomenon listed. In this case it is severe turbulence.
	Severe turbulence symbol.
210 170	The top of the severe turbulence is forecast to be FL210 and the base FL170.
NC	No change (NC) in intensity is expected during the validity of the SIGMET.
	A "zaggy" arrow points from the information box to the area (polygon) of severe turbulence.

Note that the phenomenon is the same in both examples (NZZO and NZZC FIRs), although the validity period is slightly different in each SIGMET. The difference is 7 minutes and is simply a function of the issuance time for each SIGMET, i.e., the SIGMETs were issued 7 minutes apart. The NZZC GSM was issued at 2029 UTC and the NZZO GSM was issued at 2036 UTC.