

PO Box 213, N-2001 LILLESTRØM  
 Telephone: + 47 64 84 57 60  
 Telefax: + 47 64 84 57 70

REP:  
 Date: 21 March 2002

**PRELIMINARY REPORT ON A SERIOUS INCIDENT WITH**  
**TF-FIO, ICELANDAIR FI-315**  
**22 JANUARY 2002 AT OSLO AIRPORT GARDERMOEN**

All information in this report is incomplete and subject to change as the investigation continuous.

Only the final report will represent the complete investigation and be the official document

All times given in this report is local time (UTC + 1), if not otherwise stated.

**Aircraft**

-type & reg.:	Boeing 757-208, TF-FIO
-year of man.:	1999
-engines:	RR RB 211-535E4
Radio call sign:	FI-315
Date and time:	January 22 2002 at 0949 hrs UTC
Location:	RWY 01L at Oslo airport Gardermoen
Type of occurrence:	Serious aircraft incident
Type of flight:	Scheduled commercial flight operation
Weather cond.:	METAR 0950Z: 36002 KT 2 700 –FZDZ BR FEW 001 SCT 002 BKN 003 M04/M04 Q0985 TEMPO 1 000 –FZDZ BR VV002=
Light cond.:	Daylight
Flight cond.:	IMC
Flight plan:	IFR
No. of persons onb. :	75 passengers and a crew of 7
Injuries:	None
Aircraft damage:	None
Other damage:	None
Commander	
-sex/age:	Male, age 43 years
-licence:	ATPL
-fl. experience:	Total flight time 8 034 hrs, 2 061 hrs on B757
Information sources:	Commanders “Voyage Report”, First Officers “Flight Occurrence Report”, the company’s Standard Operating Procedure (SOP), Flight Recorder Data (FDR), Senior Cabin Attendants report, taped communication between the aircraft and Gardermoen TWR, radar readout and several passenger reports.

## FACTUAL INFORMATION

A scheduled flight, a Boeing B757 with the registration TF-FIO from Icelandair with flight number FI-315, departed Keflavik (BIKF) airport at 0735 UTC for Oslo airport Gardermoen (ENGM) on 22 January 2002. The flight was dispatched from BIKF with the following equipment inoperative: Right ILS, right GPS and center autopilot. The flight was uneventful until the approach to ENGM. Take-off weight from BIKF was 84 073 kg, and the landing weight at ENGM was 76 731 kg. Both weights are within the normal limitations. The Commander was the flying pilot (PF) and the First Officer performed the duties of non-flying pilot (NFP).

At about 200 NM from ENGM the First Officer noted down the ATIS for ENGM from 0920 UTC which stated that RWY 01R was in use. The Commander planned for a practice CAT II approach. Instruments were set and the approach was briefed according to Icelandair Standard Operating Procedure (SOP). The crew received later clearance for descent and SIG 2E arrival. (See Appendix no. 1 = AIP NORGE/NORWAY AD 2 ENGM 4 – 16 and 4 – 15.) During the descent FI-315 was cleared direct to SONER with free speed below FL 100.

The commander slowed the aircraft speed down to approx. 240 kt. During the descent the crew was informed from ATC that RWY in use at ENGM was changed to RWY 01L. This is not a CAT II APP. The crew did a new approach briefing for this RWY. The aircraft was high on the approach profile and the Commander used speed brakes. The ATC cleared FI-315 direct to NDB Solberg (SLB). (See Appendix no. 2: AIP NORGE/NORWAY AD 2 ENGM 5 – 1.) During the descent the First Officer as NFP identified left and center ILS and the NDB SLB.

Approach Control cleared FI-315 to 3 000 ft and informed the crew they could expect inbound turn on the localizer (LLZ) in 8 NM. At that point FI-315 was 10 NM from NDB SLB. The aircraft was slowed down to 220 KT, flaps were extended and landing gear was selected down. Almost overhead NDB SLB the crew received clearance to intercept the LLZ. The intercept angle was approx. 90°. Approach mode was selected on the Mode Control Panel (MCP). This late inbound turn caused a marked overshoot of the LLZ due to the limitations of the Autopilot (AP). The AP corrected to the left to intercept again. At this time FI-315 was cleared down to 2 500 ft and this altitude was set on the MCP. When the aircraft finally was established on the LLZ it was at least 1 dot high on the Glide Path (G/P). Flaps 20° was set with appropriate speed selection.

The descent and initial approach was made in strong tailwind. When established on the LLZ at 3 000 ft, the tailwind velocity was approx. 40 kt. The crew was not informed by the ATC about the strong tailwind on final. The wind on the ground was light from the North.

The Commander doubted that the AP in AUTO mode could capture the GP, he therefore disconnected both AP's and the Autothrottle (AT) with the thumb-switches in order to manually capture the GP from above. Shortly there after the Commander informed the first officer that raw data information on his ADI and HSI were lost. He therefore reduced the rate of descent. The raw data signals on his panel came in and disappeared again. At this

time the Commander considered the flight to be unstabilized and that a safe landing could not be made. He therefore announced and initiated Go-Around (GA).

The GA was initiated with GA thrust and attitude by auto GA mode and flaps 20°. When a positive rate of climb was reached, the landing gear was retracted. SOP calls for GA altitude to be set on MCP when stabilized on GP in the approach. As the aircraft was never stabilized on GP, 2 500 ft was on MCP, altitude capture occurred almost immediately, causing throttles to retard to idle as existing speed was higher than the speed selected on MCP, and the flight Director (FD) commanded level off at 2 500 ft. Flaps 20° was maintained during the GA. The aircraft had in the meantime climbed to a higher altitude (FDR = 3 735 ft). The FD pitch bar therefore commanded max pitch down to get the aircraft back to 2 500 ft. The First Officer called for “bug up” (to set the flaps up manoeuvring speed) to set the airspeed on the air speed indicator, and the Commander pushed on the Flight Level Change Switch (FLCH) button to break the altitude lock on. At this time the speed was dropping and the Commander pushed the flight controls aggressively forward (FDR = -0,60 “G”), which with the combined effect of idle thrust changed the aircraft attitude to a severe nose down attitude. (FDR max pitch angle = -49°.) The aircraft started a rapid descent. The Commander pulled back at the controls, disengaged the A/T again with the thumbswitch and manually put the throttles full forward. The first officer, who at this time became concerned about the manoeuvring of the aircraft, simultaneously pulled hard back on the controls.

The descent was arrested at an altitude above ground of 321 ft and with a positive maximum “G” of 3,58. The aircraft now entered a steep climb (FDR max pitch angle = +37°) with full engine thrust. Again abrupt flight control inputs was made when the aircraft was levelled off at 4 000 ft. The speed limit for flaps 20° was exceeded. The incident from the start of the GA until established at 4 000 ft lasted approx. 3 minutes.

When established at 4 000 ft the appropriate selections were made on the MCP. The AP was engaged. The First officer reported the GA to the Approach Control, which gave FI-315 vectors for a new approach. When established on final the Commanders raw data disappeared again, and he handed over the control of the aircraft to the First Officer who landed the aircraft at 1002 UTZ.

The Commander was not aware of the fact that the aircraft could have been overstressed. The flight continued to Stockholm airport Arlanda and later on to Iceland. The flights were uneventful and all systems worked normally.

The aircraft, TF-FIO, continued operating until 25<sup>th</sup> of January when a C-check was started on the aircraft. The aircraft was released on the 7<sup>th</sup> of February, and was flying on scheduled flights until 13<sup>th</sup> of March when the Boeing Company recommended further inspections after valuating the incident’s data from the FDR.

The morning after the incident, Icelandair informed AAIB Iceland, describing the occurrence as an “upset” after a GA at Gardermoen. AAIB Iceland informed AAIB/N the same morning that an occurrence had taken place at Gardermoen January 22. The seriousness of the incident was not evident, and AAIB/N did not start an investigation, at

that time. On the 31<sup>st</sup> of January AAIB/N received information about the incident indicating the necessity to start an investigation. AAIB Iceland was informed and they appointed an accredited representative.

Later AAIB/N received letters from concerned passengers requesting the incident to be investigated.

AAIB/N will continue the investigation of this incident.

## **SAFETY RECOMMENDATIONS**

AAIB/N recommend:

The company should review the operational procedure for the Boeing B757 regarding aborted approaches. The company should also check if the flight crew training covers an unstabilized approach followed by a GA.

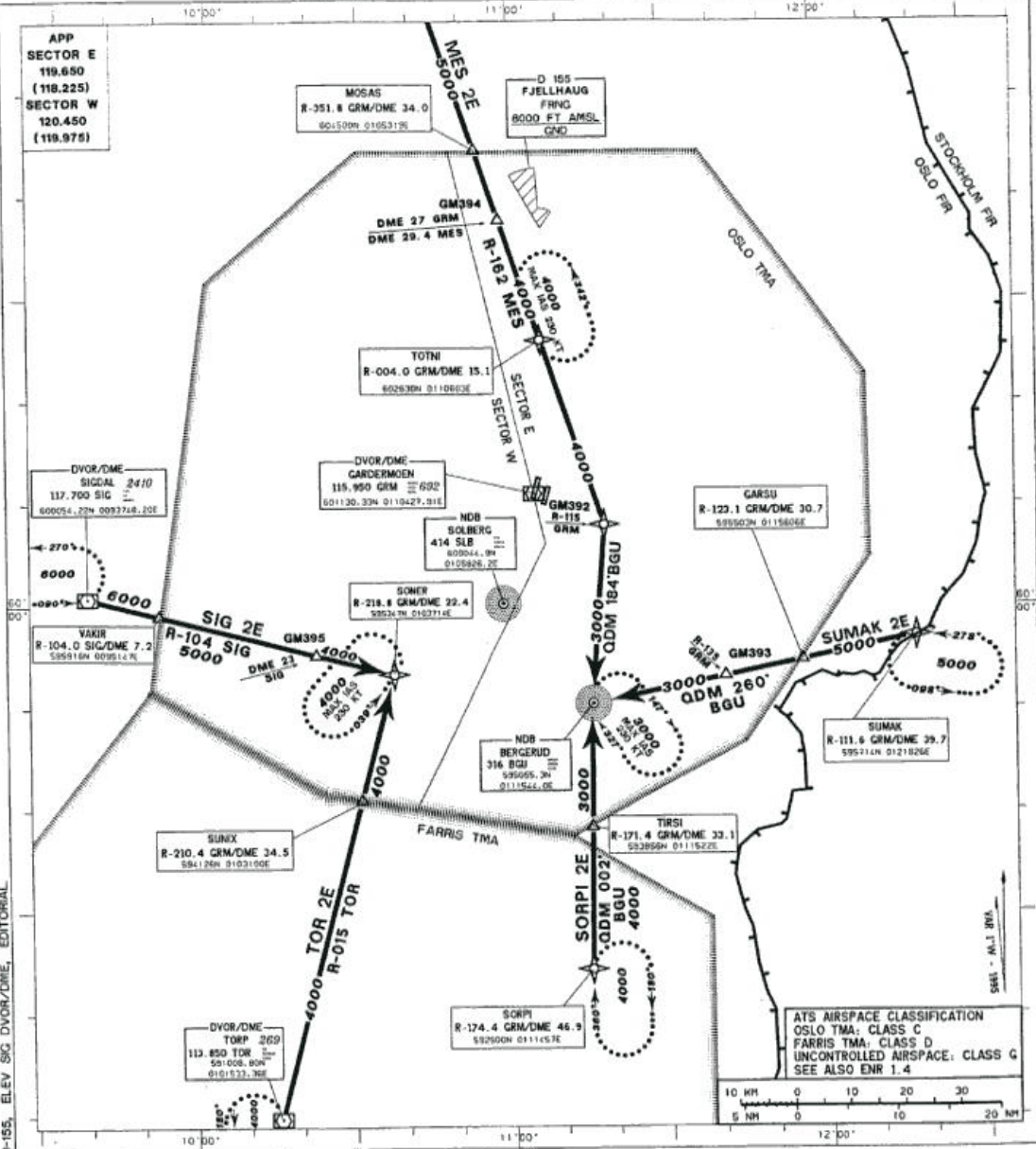
The company should consider reviewing its procedures of informing the passengers after unwanted occurrences.

3 Appendixes: AIP NORGE

AIP NORGE/NORWAY

AD 2 ENGM 4 - 15

<b>STANDARD ARRIVAL CHART INSTRUMENT (STAR) - ICAO</b>		BRG, TR AND RDL ARE MAGNETIC ALT AND ELEV ARE IN FEET DIST IN NAUTICAL MILES	TWR ATIS 118.300 126.125 120.100 GND DIR 131.350
		1:1000000 TA 7000	<b>RWY 01L/R OSLO/GARDERMOEN NORWAY</b>



<p><b>CHANGES:</b> SONER HLDG, D-155, ELEV SIG DVOR/DME, EDITORIAL</p> <p><b>GARSU</b> 595503N 0115606E R-123.1 GRM DME 30.7  <b>MOSAS</b> 604500N 0105319E R-351.8 GRM DME 34.0/R-162.0 MES DME 22.2  <b>SONER</b> 595347N 0103714E R-104.0 SIG DME 30.7/R-015.0 TOR DME 45.1/R-218.8 GRM DME 22.4  <b>SORPI</b> 592500N 0111457E R-174.4 GRM DME 46.9  <b>SUNAK</b> 595714N 0121826E R-111.6 GRM DME 39.7  <b>SUNX</b> 594126N 0103100E R-210.4 GRM DME 34.5/R-015.0 TOR DME 32.3  <b>TIRSI</b> 593856N 0111522E R-171.4 GRM DME 33.1  <b>TOTNI</b> 602630N 0110603E R-004.0 GRM DME 15.1/R-162.0 MES DME 41.8  <b>VAKIR</b> 595916N 0095147E R-104.0 SIG DME 7.2/R-252.9 GRM DME 38.4</p>	<p><b>GM392</b> 600826N 0111814E R-115.0 GRM DME 7.5/R-162.0 MES DME 60.9  <b>GM393</b> 595333N 0114117E R-135.0 GRM DME 25.8  <b>GM394</b> 603815N 0105800E R-162.0 MES DME 29.4/R-354.2 GRM DME 27.0  <b>GM395</b> 595537N 0102220E R-104.0 SIG DME 23.0/R-234.3 GRM DME 26.5</p> <p style="text-align: right;"><b>STAR DESCRIPTION OVERLEAF.</b></p>
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

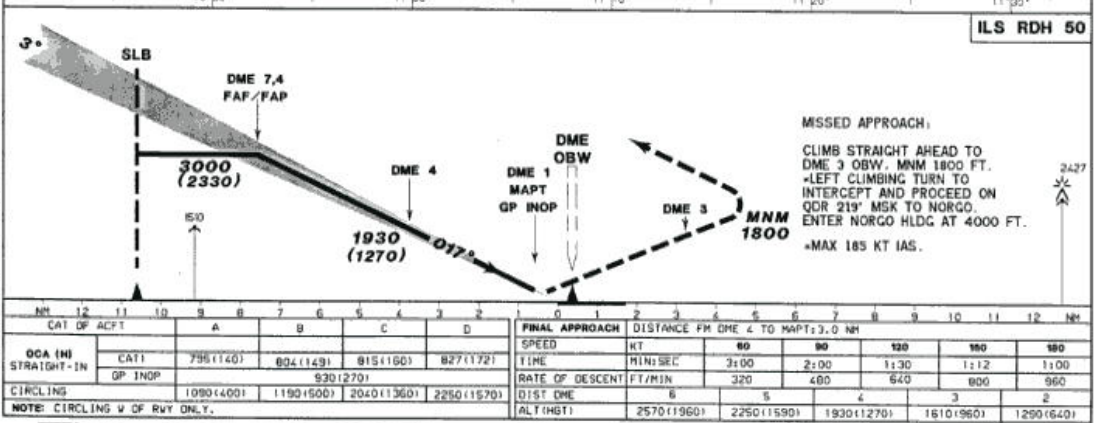
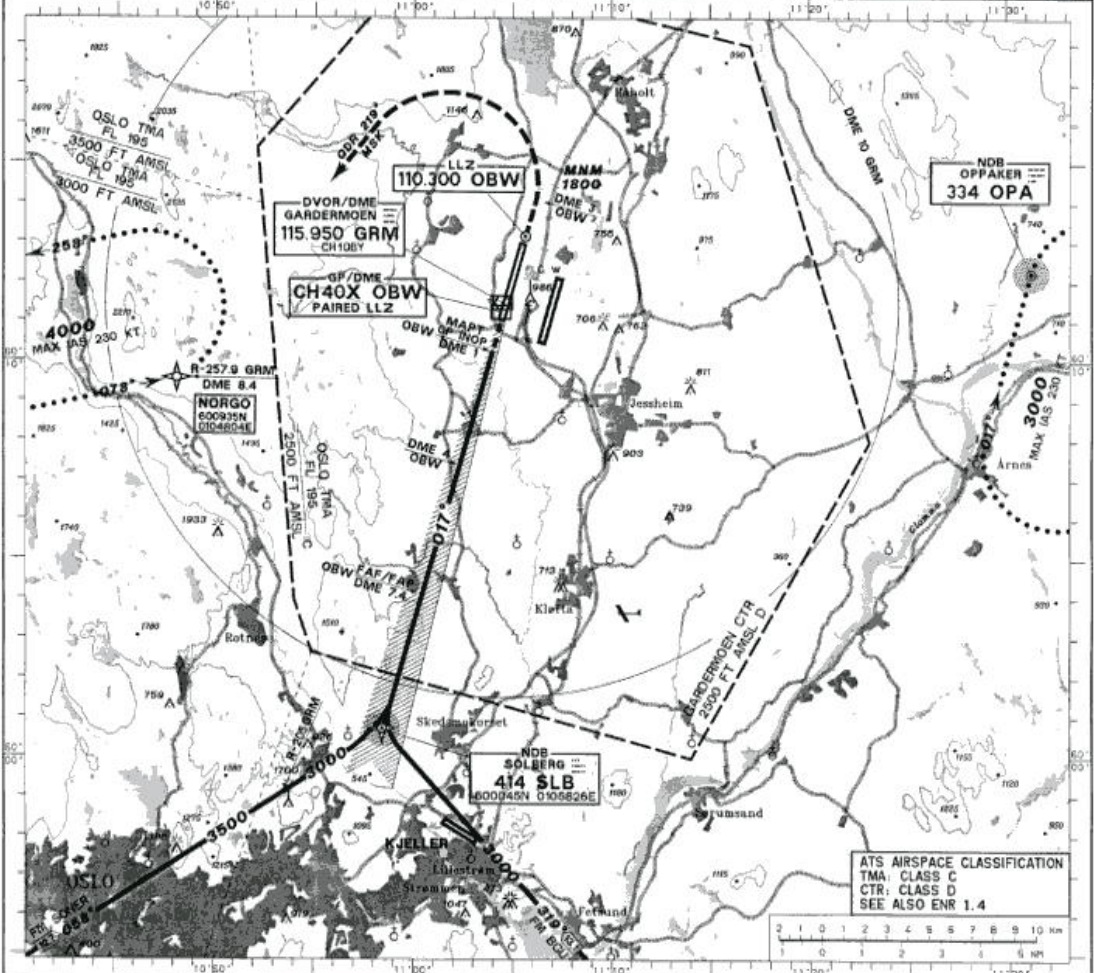
LUFTHAVSVERKET, NORGE  
 CIVIL AVIATION ADMINISTRATION, NORWAY

25 FEB 1999

AIP NORGE/NORWAY

AD 2 ENGM 5 - 1

<b>INSTRUMENT APPROACH CHART-ICAO</b> T:275000		HGT RELATED TO THR OIL ELEV 656 FT. CIRCLING HGT RELATED TO AD ELEV 681 FT. ALTITUDE, ELEVATION AND HGT IN FT. BEARINGS ARE MAG.	TWR	APP	DIR	ATIS	<b>OSLO GARDERMOEN NORWAY</b> <b>ILS-01L</b>
			116.300 (123.325)	119.850 120.450	131.350	126.125 CLR 121.800 GND 121.675	
			TA 7000	VAR 1° W (1995)			



CAT OF ACFT	A	B	C	D	FINAL APPROACH					
					SPEED	TIME	RATE OF DESCENT	DIST DME	ALT (HGT)	TIME
CCA (H)	795 (140)	804 (149)	815 (160)	827 (172)	60	3:00	320	4	2570 (1960)	11
STRAIGHT-IN					90	2:00	480	5	2250 (1590)	10
GP INOP		930 (270)			120	1:30	640	6	1930 (1270)	9
	1090 (400)	1190 (500)	2040 (1360)	2250 (1570)	150	1:12	800	7	1610 (960)	8
					180	1:00	960	8	1290 (640)	7

NOTE: CIRCLING W OF RVY ONLY.

LUFTRAFISVERNET, NORGE  
 NORWEGIAN AIR TRAFFIC AND AIRPORT MANAGEMENT

18 MAY 2000

AD 2 ENGM 4 - 16

AIP NORGE/NORWAY

**STANDARD ARRIVAL ROUTES -  
(STAR)****OSLO/GARDERMOEN  
RWY 01L/R**

<b>SPEED RESTRICTION:</b>	Advise ATC if/when reducing below instructed speed.
<b>RADAR VECTORIZING:</b>	Expect radar vectoring for sequencing to final.
<b>NOTE:</b>	RNAV based on VOR/DME REF FAC Gardermoen DVOR/DME GRM FREQ 115.950 MHZ/CH 106Y PSN: 601130.33N 0110427.91E Altitudes shown on this chart are minimum obstacle clearance altitudes only. PIC must strictly follow instructions from ATC concerning altitudes and flight levels.
<b>DESCEND:</b>	As cleared by ATC.

DESIGNATOR	ROUTE	RESTRICTIONS
MESNALI TWO ECHO ARRIVAL (MES 2E)	From MES proceed on R-162 MES via MOSAS and TOTNI. On passing R-115 GRM turn right DCT BGU. RNAV: MES - MOSAS - GM394 - TOTNI - GM392 - BGU.	Cross MOSAS FL 190 or below and max speed 250KIAS or as instructed by ATC.
SIGDAL TWO ECHO ARRIVAL (SIG 2E)	From SIG proceed on R-104 SIG via VAKIR to SONER. RNAV: SIG - VAKIR - GM395 - SONER.	Cross VAKIR FL 190 or below and max speed 250KIAS or as instructed by ATC.
SORPI TWO ECHO ARRIVAL (SORPI 2E)	From SORPI proceed on QDM 002° BGU via TIRSI to BGU. (RNAV required for SORPI HLDG) RNAV: SORPI - TIRSI - BGU.	Cross TIRSI FL 190 or below and max speed 250KIAS or as instructed by ATC.
SUMAK TWO ECHO ARRIVAL (SUMAK 2E)	From SUMAK proceed on QDM 260° BGU via GARSU to BGU. (RNAV required for SUMAK HLDG) RNAV: SUMAK - GARSU - GM393 - BGU.	Cross GARSU FL 190 or below and max speed 250KIAS or as instructed by ATC.
TORP TWO ECHO ARRIVAL (TOR 2E)	From TOR proceed on R-015 TOR via SUNIX to SONER. RNAV: TOR - SUNIX - SONER.	Cross SUNIX FL 190 or below and max speed 250KIAS or as instructed by ATC.

**WAY-POINT LIST:**

Ident	LAT/LONG	Definition	MIN ALT (FT)	RMK
BGU	595055.3N 0111544.0E	BGU NDB	3000 FT	
GARSU	595503N 0115606E	R-123.1 GRM DME 30.7	5000 FT	
GM392	600826N 0111814E	R-115.0 GRM DME 7.5 R-162.0 MES DME 60.9	4000 FT	Turn and step-down fix
GM393	595333N 0114117E	R-135.0 GRM DME 25.8 QDM 260° BGU	5000 FT	Step-down fix
GM394	603815N 0105800E	R-162.0 MES DME 29.4 DME 27 GRM	5000 FT	Step-down fix
GM395	595537N 0102220E	R-104.0 SIG DME 23.0	5000 FT	Step-down fix
MES	610559.26N 0103834.02E	MES DVOR/DME	5000 FT	
MOSAS	604500N 0105319E	R-351.8 GRM DME 34.0 R-162.0 MES DME 22.2	5000 FT	
SIG	600054.22N 0093748.20E	SIG DVOR/DME	6000 FT	
SONER	595347N 0103714E	R-218.8 GRM DME 22.4 R-104.0 SIG DME 30.7 R-015.0 TOR DME 45.1	4000 FT	
SORPI	592500N 0111457E	R-174.4 GRM DME 46.9	4000 FT	
SUMAK	595714N 0121826E	R-111.6 GRM DME 39.7	5000 FT	
SUNIX	594126N 0103100E	R-210.4 GRM DME 34.5 R-015.0 TOR DME 32.3	4000 FT	
TIRSI	593856N 0111522E	R-171.4 GRM DME 33.1	4000 FT	
TOR	591008.80N 0101533.36E	TOR DVOR/DME	4000 FT	
TOTNI	602630N 0110603E	R-004.0 GRM DME 15.1 R-162.0 MES DME 41.8	4000 FT	
VAKIR	595916N 0095147E	R-104.0 SIG DME 7.2	6000 FT	

25 FEB 1999

Luftfartsverket, Norge  
Civil Aviation Administration, Norway