

REPORT

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

REP: 4/2001
Date: 18 January 2001

All times given in this report are UTC.

Aircraft

-type & reg.:	Cessna C 650, LN-NLD and Airbus A 320, HS-IPZ
Radio call sign:	NOO 03, SWR 417
Date and time:	02 June 2000, 1525 UTC
Location:	Approximately 20 NM south of ENGM
Type of occurrence:	Air traffic incident, AIRPROX
Type of flight:	Ambulance flight / commercial airline operation
Light cond.:	Daylight
Flight cond.:	IMC, both aircraft
Flight plan:	IFR, both aircraft
Information sources:	Report from ATC, Commanders reports and AAIB/Ns own investigations.

SUMMARY

Oslo Airport Gardermoen, ENGM, is located north of the city of Oslo Norway. The Terminal Control Area (TMA), is divided into 2 sectors by a line running roughly north - south through the centre of the airport. The sectors are named APPROACH SECTOR EAST and APPROACH SECTOR WEST. A separate ATC controller controls the traffic in each sector. A system of STARs (Standard Instrument Arrivals), and SIDs (Standard Instrument Departures), has been established to orderly regulate the arriving and departing traffic (see Appendix 1).

NOO 03 was operating a domestic flight from Sandefjord Airport Torp, ENTO, to ENGM. The aircraft was under the control of Oslo APP, TMA EAST on freq. 119.65 MHz, cleared to fly STAR TOR 2F and at the time of the incident maintaining FL 100. The aircraft was flown in accordance with clearance.

SWR 417 was operating an international flight from ENGM to Zurich Airport, LSZH. The fly SID SKI 2C but also cleared to deviate from track to avoid CB (Cumulonimbus). At the time of the incident SWR 417 was in a right turn leaving FL 100 for FL 190. The aircraft was flown in accordance with the controller's instructions.

The weather in the area at the time of the incident included moderate to heavy CB activity, requiring considerable deviation from published SIDs in order to avoid CBs.

At time 1525:17 SWR 417 reported a TCAS Warning to TMA WEST indicating a lateral distance of 2 NM to the other aircraft and at almost same flight level. The commander of SWR 417 indicated that a formal report would be submitted.

The commander of NOO 03 was later informed about the incident by CAA and asked to submit a report.

The incident was investigated by OSLO ATCC and a report submitted to AAIB/N.

The STAR TOR 2F and SID SKI 2C are located in different sectors of OSLO TMA. The STAR and the SID are located close to the common border between the two sectors.

A separate controller in each sector, utilising a separate radio frequency provides air Traffic Control.

A system for provision of altitude separation between aircraft on STAR TOR 2F and SID SKI 2C is in force in DEP AREA 19R. The local Oslo ATCC regulation, part 3, chap. 2 and part 3, chap. 3 contains the maximum and minimum altitudes to be maintained by north- and south bound traffic until clear of DEP AREA 19R.

The incident took place approximately 10 NM south of DEP AREA 19R.

AAIB/N COMMENTS AND ANALYSIS

SID SKI 2 C contains a noise abatement procedure involving a left turn after take off, bringing the tracks of SID SKI 2C and STAR TOR 2F closer than 5 NM from each other at a point approximately 8 NM south of the departure end of RWY 19L. The result is a situation that may cause insufficient lateral separation between aircraft operating on the STAR and SID respectively. Close co-ordination between the two controllers in order to ensure sufficient vertical separation is therefore a requirement when both procedures are in use simultaneously.

At the time of the Airprox, an agreement between the two controllers were in force, specifying altitude limits for inbound and outbound traffic in order to provide separation.

Due to high workload in connection with CB avoidance, co-ordination between the two controllers broke down. The controllers started to assume that the other controller had taken certain actions without taking the time to verify it. Instructions given to the two aircraft were based on assumptions and this eventually led to the incident.

The incident was caused by ATC controller overload and breakdown of co-ordination in a situation requiring extensive re-routing of aircraft due to CB avoidance.

The incident does however indicate a weakness in the STAR - SID system at Oslo Airport Gardermoen.

One STAR and one SID, located in different sectors, frequently used simultaneously and not providing sufficient lateral separation, constitutes a potential safety hazard. This problem is normally solved by a general agreement between the controllers involved and by individual improvisation in each separate case. At times of high workload, such as at the time of this incident, controllers can easily be overloaded, resulting in a breakdown in co-ordination between the controllers. Reliable safeguards to prevent this from happening are not found in the system at present time.

The conflict between optimal safety and noise abatement is often present when STARs and SIDs are constructed. The AAIB/N will emphasise the need for extensive risk analysis whenever such conflicts are identified and that a conservative policy is followed.

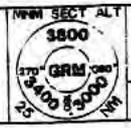
Unless there is sufficient lateral separation between the different procedures in use, a rigid set of rules for ascertaining proper co-ordination between controllers will be required in order to obtain an acceptable level of safety.

RECOMMENDATIONS

The AAIB/N recommends that the CAA/N consider a revision of all aspects concerning the STAR and SID procedures at Oslo Airport Gardermoen in order to ensure adequate separation between arriving and departing aircraft (Recommendation no. 4/2001).

AIP NORGE/NORWAY

STANDARD ARRIVAL CHART
INSTRUMENT (STAR) - ICAO

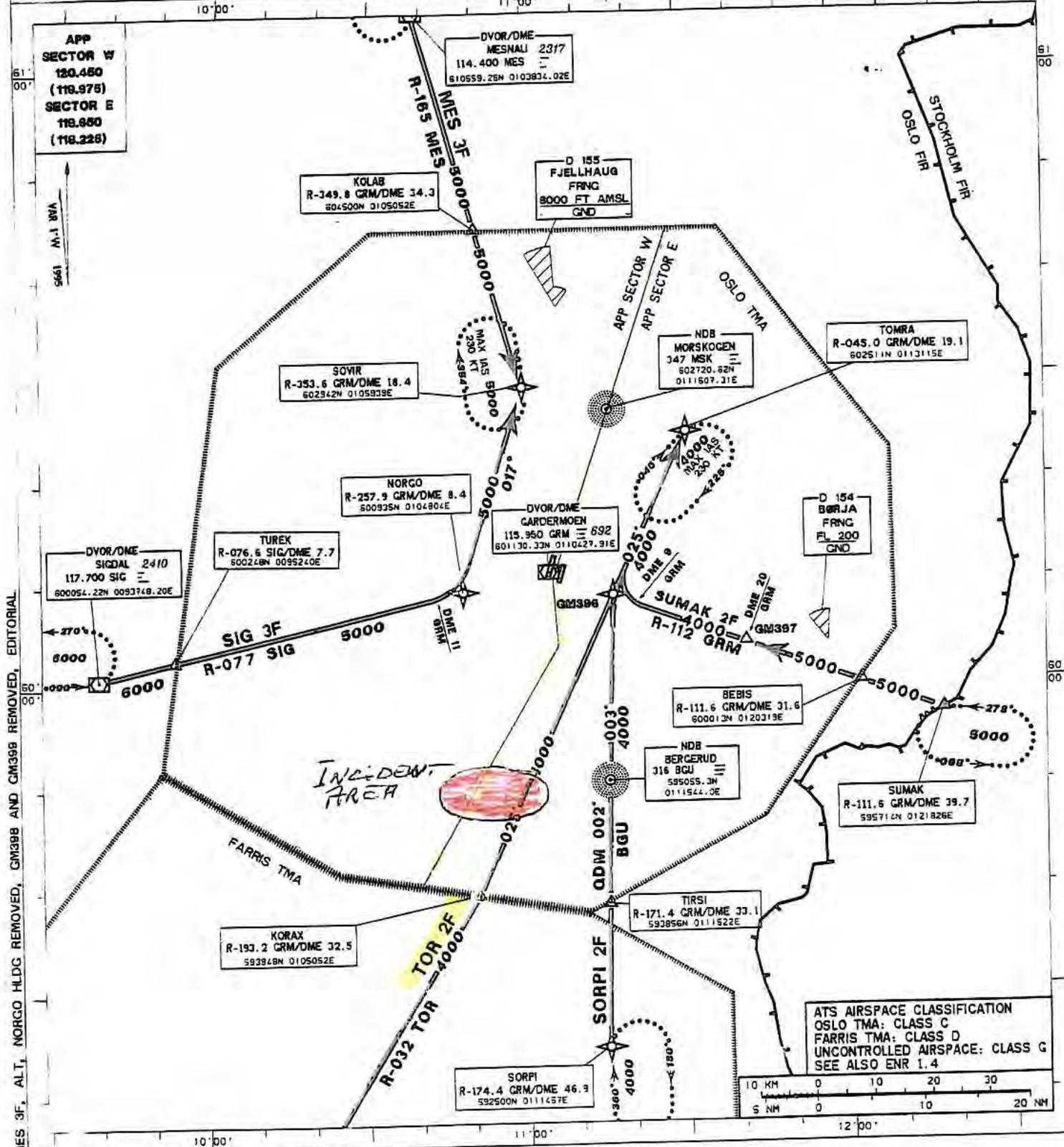


BRG, TR AND RDL ARE MAGNETIC
ALT AND ELEV ARE IN FEET
DIST IN NAUTICAL MILES

TWR 118.300
120.100
DIR 131.350
ATIS 128.125
GND -

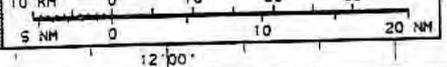
RWY 19L/R
OSLO/GARDERMOEN
NORWAY

1:1000000 TA 7000



CHANGES: STAR SIG 3F, MES 3F, ALT, NORGO HLDG REMOVED, GM398 AND GM398 REMOVED, EDITORIAL

ATS AIRSPACE CLASSIFICATION
OSLO TMA: CLASS C
FARRIS TMA: CLASS D
UNCONTROLLED AIRSPACE: CLASS G
SEE ALSO ENR 1.4

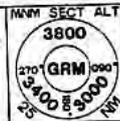


BEBIS 600013N 0120319E	R-111.8 GRM DME 31.8	GM396 600911N 0111647E	R-111.8 GRM DME 6.8
KOLAB 604500N 0105052E	R-349.8 GRM DME 34.3/R-185.0 MES DME 21.9	GM397 600424N 0114150E	R-111.8 GRM DME 20.0
KORAX 593948N 0105052E	R-193.2 GRM DME 32.5/R-032.0 TOR DME 34.8		
NORGO 600935N 0104804E	R-257.9 GRM DME 8.4/R-078.6 SIG DME 36.3		
SORPI 592500N 0111457E	R-174.4 GRM DME 46.9		
SOVIR 602942N 0105939E	R-353.6 GRM DME 18.4/R-185.0 MES DME 37.8		
SUMAK 595714N 0121826E	R-111.6 GRM DME 39.7		
TIRSI 593856N 0111522E	R-171.4 GRM DME 33.1		
TOMRA 602511N 0113115E	R-045.0 GRM DME 19.1		
TUREK 600248N 0095240E	R-076.6 SIG DME 7.7/R-257.9 GRM DME 37.0		

STAR DESCRIPTION OVERLEAF.

AIP NORGE/NORWAY

STANDARD DEPARTURE CHART
INSTRUMENT (SID) - ICAO



BRG, TR AND RDL ARE MAGNETIC
ALT AND ELEV ARE IN FEET
DIST IN NAUTICAL MILES

1:1000000 TA 7000

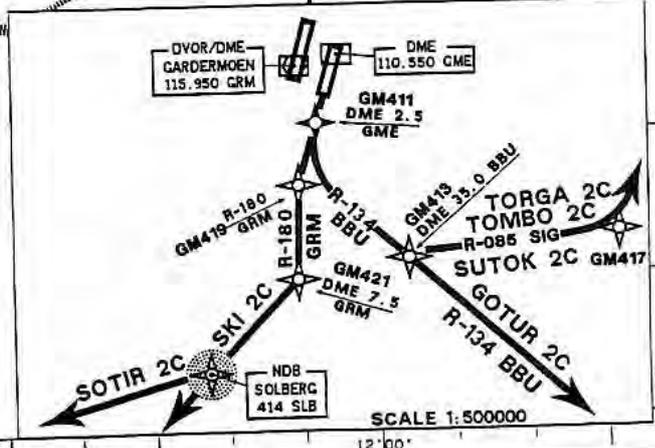
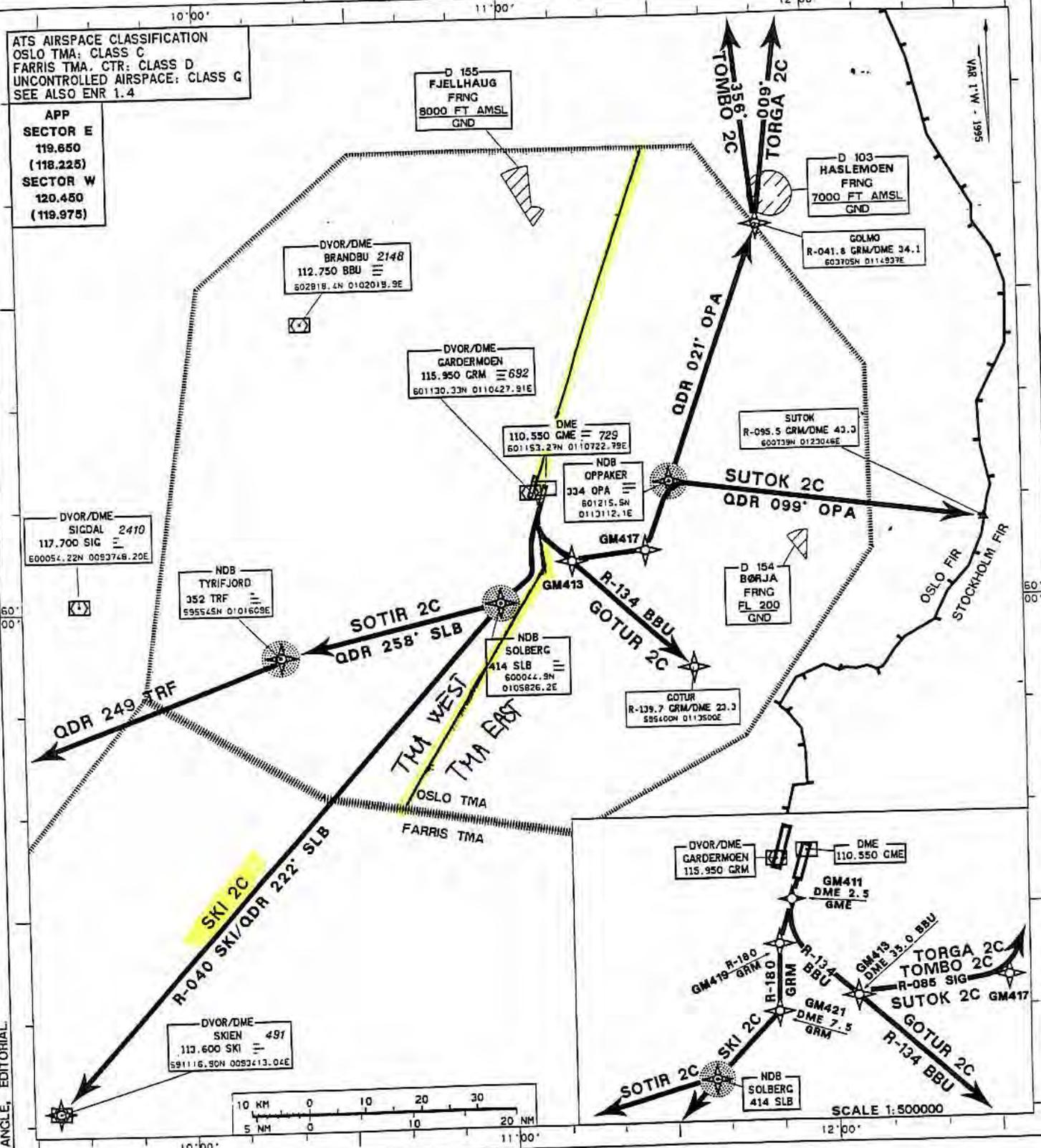
TWR 118.300
120.100
DIR 131.350

ATIS 127.150
GND -

RWY 19L
OSLO/GARDERMOEN
NORWAY

ATS AIRSPACE CLASSIFICATION
OSLO TMA: CLASS C
FARRIS TMA, CTR: CLASS D
UNCONTROLLED AIRSPACE: CLASS G
SEE ALSO ENR 1.4

APP
SECTOR E
119.650
(118.225)
SECTOR W
120.450
(119.975)



GOLMO	603705N 0114937E	R-041.8 GRM DME 34.1	GM411	600930.84N 0110552.20E	RWY TRACK/DME 2.5 GME R-161.7 GRM DME 2.1
GOTUR	595400N 0113500E	R-139.7 GRM DME 23.3	GM413	600442.65N 0111207.87E	R-134.2 BBU DME 35.0
SOTIR	591935N 0073000E	R-067.0 ZOL DME 63.6	GM417	600534.88N 0112620.20E	R-085.3 SIG DME 54.6/QDR 201° OPA
SUTOK	600739N 0123048E	R-095.5 GRM DME 43.3	GM419	600719.51N 0110436.68E	R-180.0 GRM DME 4.2
TOMBO	620000N 0113345E	R-008.2 GRM DME 109.7	GM421	600401.59N 0110443.58E	R-180.0 GRM DME 7.5
TORGA	620000N 0121019E	R-016.9 GRM DME 113.4			

SID DESCRIPTION OVERLEAF.

CHANGES: REMARKS, BANK ANGLE, EDITORIAL.