Aviation Investigation Final Report

Location:	DFW Airport, Texas	**Incident Number:**	FTW01IA183
Date & Time:	August 16, 2001, 10:24 Local	**Registration:**	N308WA
Aircraft:	Boeing 737-347	**Aircraft Damage:**	Minor
Defining Event:		**Injuries:**	130 None
Flight Conducted Under:	Part 121: Air carrier - Scheduled		

Analysis

A Boeing 737 was cleared to takeoff on runway 18L at the Dallas/Fort Worth International Airport. After landing on runway 18R, another Boeing 737 took the high speed exit onto taxiway Whiskey Mike and was cleared to cross runway 18L. The pilots of both aircraft saw a possible impending collision and took evasive action. The taxiing aircraft continued to the gate and deplaned the passengers. The departing aircraft continued the takeoff, returned to the airport and landed. Examination of this airplane revealed damage to the skin on the underside of the tail. At the time of the runway incursion, the West air traffic control tower's ground control west one and local west one controller positions were combined. The west air traffic control tower supervisor-in-charge was operating the flight data position along with performing his own supervisory duties. During this time, a National Air Traffic Controllers Association representative had entered the tower cab and was having a meeting with the supervisor-in-charge. In an interview, the incident controller reported that he did not scan runway 18L before clearing the taxiing aircraft to cross. FAA Order 7110.65, Air Traffic Control Handbook, paragraph 3-1-3, "Use of Active Runways," states, "The local controller has primary responsibility for operations conducted on the active runway and must control the use of those runways." Paragraph 3-1-12, "Visually Scanning Runways," states that, "Local controllers shall visually scan runways to the maximum extent possible."

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this incident to be: The local controller clearing the taxiing aircraft to cross the runway in front of the aircraft on takeoff roll. Contributing factors were the local controller's failure to follow FAA procedures and directives to visually scan the runway prior to issuing the crossing clearance, the local controller’s excessive workload, and the tower supervisor's inadequate supervision.

Findings

Occurrence #1: NEAR COLLISION BETWEEN AIRCRAFT
Phase of Operation: TAKEOFF

Findings
1. (C) ATC CLEARANCE - PREMATURE - ATC PERSONNEL(LCL/GND/CLNC)
2. (F) PROCEDURES/DIRECTIVES - NOT COMPLIED WITH - ATC PERSONNEL(LCL/GND/CLNC)
3. (F) SUPERVISION - INADEQUATE - ATC PERSONNEL(SUPERVISOR)
4. (F) EXCESSIVE WORKLOAD (TASK OVERLOAD) - ATC PERSONNEL(LCL/GND/CLNC)

Factual Information

HISTORY OF FLIGHT

On August 16, 2001, at 1024 central daylight time, a Boeing 737-347, N308WA, operating as Delta Airlines Flight 1521 (DAL1521), sustained minor damage, and a Boeing 737-524, N33635, operating as Continental Airlines Flight 1487 (COA1487), was not damaged during a runway incursion at the Dallas/Fort Worth International Airport (DFW), Texas. DAL 1521 was being operated by Delta Air Lines, Inc., of Atlanta, Georgia under 14 Code of Federal Regulations Part 121, as a scheduled domestic passenger flight, from DFW to Oakland, California. COA 1487 was being operated by Continental Airlines, Inc., of Houston, Texas under 14 Code of Federal Regulations Part 121, as a scheduled domestic passenger flight, from Cleveland, Ohio to DFW. There were no injuries to either the 125 passengers and the 5 crewmembers aboard DAL 1521, or to the 55 passengers and the 5 crewmembers aboard COA 1487.

The flight crew of DAL 1521 reported that as they were taxiing and approaching runway 18L, the tower controller, local west one (LW1) instructed them to hold short and shortly thereafter were issued a "taxi into position and hold" clearance. As they were turning onto the runway, LW1 issued a takeoff clearance. The Captain, who was the flying pilot, began the takeoff roll. Shortly thereafter, both pilots observed a Continental 737 taxiing east on taxiway Whiskey Mike. The Continental 737 "approached then passed the hold point for runway 18L and continued taxiing onto the runway." As the aircraft entered the runway, the Captain "pushed the throttles to max and began to rotate." As the aircraft rotated a "slight bump" was felt, and they passed directly over the Continental 737, clearing the top of the fuselage by "100 or more feet." DAL 1521 continued the takeoff and landed back at DFW, taxied to the gate and deplaned the passengers. DAL 1521 returned to DFW because the pilots believed the airplane's tail may have impacted the runway during takeoff. Examination of the airplane by NTSB investigators revealed damage to the skin on the underside of the tail, consistent with contact with the runway surface.

The flight crew of COA 1487 reported that they landed "normally" on runway 18R and took the high speed exit Echo Five. As they were slowing down, while expecting to receive instructions to hold short of runway 18L, the LW1 controller instructed them to "cross runway 18L, turn left on foxtrot to the gate with me." As the Captain increased power to cross runway 18L, he looked to his left and "saw an aircraft on the runway that looked like it was holding for takeoff." As their aircraft started to nose out on the runway, the pilots realized that the aircraft on runway 18L was on its takeoff roll. The Captain determined that he "could not stop the aircraft in a safe location," so he increased power to try and clear the runway. The Captain estimated that "about half of my aircraft was still on the runway when the other aircraft passed overhead," and he estimated that the aircraft "passed about 100 feet above us." COA1487 continued to the gate and deplaned the passengers.

AIR TRAFFIC CONTROL

Approximately 1015, the West air traffic control tower (ATCT) supervisor-in-charge (ASW) instructed ground control west one (GW1) and LW1 controllers to combine positions. ASW was operating the flight data position (FD) combined with his own supervisory duties. At 1017:16, the incident LW1 controller received a position relief briefing and assumed responsibility for the LW1/GW1 combined position.

At 1019:26, on the LW1 frequency, the pilot of COA1487 transmitted that he was on approach for runway 18R. Three seconds after the pilot of COA1487 began his transmission, the pilot of a non-involved airplane, DAL 2238, transmitted that he needed to exit taxiway Y to address a problem. LW1 instructed DAL 2238 to stop at taxiway Yankee near runway 18L and advise him when the flight was ready to continue taxiing. At 1019:57, LW1 cleared the pilot of COA1487 to land on runway 18R, and the pilot acknowledged the clearance.

During the next 43 seconds, LW1 made six transmissions to and received five transmissions from pilots and vehicle operators regarding taxiway instructions.

Approximately 1020, the DFW ATCT National Air Traffic Controllers Association (NATCA) representative entered the tower cab and requested a meeting with the ASW.

At 1020:49, the pilot of DAL1521 transmitted on the GW1 frequency that he was located on the south side of Zulu bridge. LW1 instructed the pilot to proceed straight ahead for runway 18L. The pilot acknowledged.

During the next 2 minutes 30 seconds, LW1 made five transmissions to and received eight transmissions from taxiing pilots.

At 1022:36, LW1 cleared the pilot of DAL1521 to taxi into position and hold on runway 18L. The pilot acknowledged.

At 1022:42, LW1 transmitted, "Delta seventeen twenty nine, do we have a problem? Cuz you're stopping traffic." The pilot had stopped the airplane in front of the B bridge. The pilot responded that he needed "a moment." LW1 loudly replied that he did not "have time for a moment," because DAL1729 was blocking traffic, and LW1 needed DAL1729 to move. ASW, the union representative, and another controller present in the tower cab (GW1) all stated they heard this transmission and believed LW1 was busy. GW1 retrieved his headset and proceeded to the GW1 workstation to decombine GW1 from LW1. Meanwhile, two more pilots called and received clearances from LW1.

According to radar data , at 1023:01, COA1487 had landed and was rolling out on runway 18R.

At 1023:14, LW1 cleared the pilot of DAL1521 for takeoff on runway 18L. As soon as the pilot

acknowledged the clearance, LW1 gave two more pilots taxi clearances.

At 1023:40, as COA1487 exited runway 18R at high speed exit Echo Five, LW1 cleared COA1487 to cross runway 18L, then to turn left on taxiway Foxtrot, and taxi to parking. The pilot acknowledged. In an interview, LW1 said he did not scan runway 18L. Following this clearance, LW1 continued giving ground control instructions to pilots on the taxiways.

According to radar data, approximately 1024:14, DAL1521 took off from runway 18L and over flew COA1487 who was crossing the runway. Approximately 1024:18, the targets of DAL1521 and COA1487 were merged at a point correlating to runway 18L at taxiway Whiskey Mike.

During interviews, each of the four control personnel in the ATCT stated that they did not see the incident.

At 1024:30, the pilot of DAL1521 attempted to contact LW1 but received no response. Two other pilots who attempted to call LW1 also received no response.

At 1024:46, LW1 instructed the pilot of DAL1521 to contact departure control. The pilot asked if LW1 had seen a Continental airplane cross in front him on take off roll. LW1 said he had not. The pilot responded that someone cleared COA1487 to cross runway 18L after he had been cleared for take off. LW1 asked the pilot his location during the incident, specifically if he was already airborne. The pilot responded that he had been on take off roll and, "We just missed him by a little bit." LW1 thanked the pilot for the report.

METEOROLOGICAL INFORMATION

At 1056, the weather observation facility at DFW reported a few clouds at 3,000 feet agl, broken clouds at 15,000 feet agl, visibility 10 statute miles, wind 020 at 3 knots, temperature 81 degrees Fahrenheit, dew point 72 degrees Fahrenheit, and altimeter 30.06 inches of Mercury.

ADDITIONAL DATA

FAA Order 7110.65, Air Traffic Control Handbook, paragraph 3-1-3, "Use of Active Runways," states, "The local controller has primary responsibility for operations conducted on the active runway and must control the use of those runways." Paragraph 3-1-12, "Visually Scanning Runways," states that, "Local controllers shall visually scan runways to the maximum extent possible."

The data from DAL 1521's Digital Flight Data Recorder (DFDR) indicates that during takeoff, N1 for engine one reached a maximum of 95.12 percent and N1 for engine two reached a maximum of 95.52 percent. Control column position reached a maximum deflection of -7.498 degrees (aft), elevator moved to a maximum deflection of -19.52 degrees (up) and pitch angle reached a peak of 20.25 degrees. Longitudinal acceleration measured a high of 0.394 g and a

low of 0.148 g; vertical acceleration reached a maximum of 1.204 g and a minimum of 0.807 g.

Pilot Information

Certificate:	Airline transport; Commercial	**Age:**	54,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	April 16, 2001
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	April 12, 2001
Flight Time:	19210 hours (Total, all aircraft), 6439 hours (Total, this make and model), 104 hours (Last 90 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Co-pilot Information

Certificate:	Airline transport; Commercial	**Age:**	45,Female
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	December 8, 2000
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	March 1, 2001
Flight Time:	9201 hours (Total, all aircraft), 7178 hours (Total, this make and model), 170 hours (Last 90 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Boeing	**Registration:**	N308WA
Model/Series:	737-347	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Transport	**Serial Number:**	23441
Landing Gear Type:	Retractable - Tricycle	**Seats:**	134
Date/Type of Last Inspection:	August 10, 2001 Continuous airworthiness	**Certified Max Gross Wt.:**	130500 lbs
Time Since Last Inspection:		**Engines:**	2 Turbo fan
Airframe Total Time:		**Engine Manufacturer:**	CFM International
ELT:	Not installed	**Engine Model/Series:**	CFM56-3-B1
Registered Owner:	State Street Bank and Trust Company	**Rated Power:**	20000 Lbs thrust
Operator:	Delta Air Lines Inc	**Operating Certificate(s) Held:**	Flag carrier (121)
Operator Does Business As:	Delta Airlines	**Operator Designator Code:**	DALA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	DFW,603 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	10:56 Local	**Direction from Accident Site:**	0°
Lowest Cloud Condition:	Few / 3000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Broken / 15000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	20°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.05 inches Hg	**Temperature/Dew Point:**	27°C / 22°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	DFW Airport, TX (DFW)	**Type of Flight Plan Filed:**	IFR
Destination:	OAKLAND, CA (OAK)	**Type of Clearance:**	IFR
Departure Time:	10:24 Local	**Type of Airspace:**	Class B

Airport Information

Airport:	Dallas/Fort Worth Int'l DFW	**Runway Surface Type:**	Concrete
Airport Elevation:	603 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	18L	**IFR Approach:**	None
Runway Length/Width:	13400 ft / 200 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	5 None	**Aircraft Damage:**	Minor
Passenger Injuries:	125 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	130 None	**Latitude, Longitude:**	32.896389,-97.037498

Administrative Information

Investigator In Charge (IIC):	Wigington, Doug
Additional Participating Persons:	Abigail A Smith; NTSB; Washington, DC Ralph C Holiday; FAA FSDO; DFW Airport, TX J. Duncan E Monaco; FAA AAI-100; Washington, DC Thomas R Wayson; National Air Traffic Controller's Association; DFW Airport, TX Kennith E Pender; Delta Airlines; Salt Lake City, UT Evert J Sinon; Continental Airlines; Houston, TX
Original Publish Date:	May 30, 2003
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this incident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=53035

Aviation Investigation Final Report

Location:	DFW Airport, Texas	**Incident Number:**	FTW01IA183
Date & Time:	August 16, 2001, 10:24 Local	**Registration:**	N33635
Aircraft:	Boeing 737-524	**Aircraft Damage:**	None
Defining Event:		**Injuries:**	60 None
Flight Conducted Under:	Part 121: Air carrier - Scheduled		

Analysis

A Boeing 737 was cleared to takeoff on runway 18L at the Dallas/Fort Worth International Airport. After landing on runway 18R, another Boeing 737 took the high speed exit onto taxiway Whiskey Mike and was cleared to cross runway 18L. The pilots of both aircraft saw a possible impending collision and took evasive action. The taxiing aircraft continued to the gate and deplaned the passengers. The departing aircraft continued the takeoff, returned to the airport and landed. Examination of this airplane revealed damage to the skin on the underside of the tail. At the time of the runway incursion, the West air traffic control tower's ground control west one and local west one controller positions were combined. The west air traffic control tower supervisor-in-charge was operating the flight data position along with performing his own supervisory duties. During this time, a National Air Traffic Controllers Association representative had entered the tower cab and was having a meeting with the supervisor-in-charge. In an interview, the incident controller reported that he did not scan runway 18L before clearing the taxiing aircraft to cross. FAA Order 7110.65, Air Traffic Control Handbook, paragraph 3-1-3, "Use of Active Runways," states, "The local controller has primary responsibility for operations conducted on the active runway and must control the use of those runways." Paragraph 3-1-12, "Visually Scanning Runways," states that, "Local controllers shall visually scan runways to the maximum extent possible."

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The National Transportation Safety Board determines the probable cause(s) of this incident to be: The local controller clearing the taxiing aircraft to cross the runway in front of the aircraft on takeoff roll. Contributing factors were the local controller's failure to follow FAA procedures and directives to visually scan the runway prior to issuing the crossing clearance, the local controller’s excessive workload, and the tower supervisor's inadequate supervision.

Findings

Occurrence #1: NEAR COLLISION BETWEEN AIRCRAFT
Phase of Operation: TAXI - FROM LANDING

Findings
1. (C) ATC CLEARANCE - PREMATURE - ATC PERSONNEL(LCL/GND/CLNC)
2. (C) VISUAL SEPARATION - NOT MAINTAINED - ATC PERSONNEL(LCL/GND/CLNC)
3. (C) PROCEDURES/DIRECTIVES - NOT COMPLIED WITH - ATC PERSONNEL(LCL/GND/CLNC)
4. (F) SUPERVISION - INADEQUATE - ATC PERSONNEL(SUPERVISOR)
5. (F) EXCESSIVE WORKLOAD (TASK OVERLOAD) - ATC PERSONNEL(LCL/GND/CLNC)

Factual Information

HISTORY OF FLIGHT

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The flight crew of DAL 1521 reported that as they were taxiing and approaching runway 18L, the tower controller, local west one (LW1) instructed them to hold short and shortly thereafter were issued a "taxi into position and hold" clearance. As they were turning onto the runway, LW1 issued a takeoff clearance. The Captain, who was the flying pilot, began the takeoff roll. Shortly thereafter, both pilots observed a Continental 737 taxiing east on taxiway Whiskey Mike. The Continental 737 "approached then passed the hold point for runway 18L and continued taxiing onto the runway." As the aircraft entered the runway, the Captain "pushed the throttles to max and began to rotate." As the aircraft rotated a "slight bump" was felt, and they passed directly over the Continental 737, clearing the top of the fuselage by "100 or more feet." DAL 1521 continued the takeoff and landed back at DFW, taxied to the gate and deplaned the passengers. DAL 1521 returned to DFW because the pilots believed the airplane's tail may have impacted the runway during takeoff. Examination of the airplane by NTSB investigators revealed damage to the skin on the underside of the tail, consistent with contact with the runway surface.

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low of 0.148 g; vertical acceleration reached a maximum of 1.204 g and a minimum of 0.807 g.

Pilot Information

Certificate:	Airline transport; Commercial	**Age:**	50,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane single-engine; Instrument airplane	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	April 2, 2001
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	April 18, 2001
Flight Time:	18200 hours (Total, all aircraft), 8000 hours (Total, this make and model), 195 hours (Last 90 days, all aircraft), 69 hours (Last 30 days, all aircraft), 8 hours (Last 24 hours, all aircraft)		

Co-pilot Information

Certificate:	Airline transport; Commercial	**Age:**	39,Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land; Multi-engine sea	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	September 20, 2000
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	May 23, 2001
Flight Time:	14000 hours (Total, all aircraft), 2500 hours (Total, this make and model), 176 hours (Last 90 days, all aircraft), 76 hours (Last 30 days, all aircraft), 8 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Boeing	**Registration:**	N33635
Model/Series:	737-524	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Transport	**Serial Number:**	26339
Landing Gear Type:	Retractable - Tricycle	**Seats:**	110
Date/Type of Last Inspection:	July 31, 2001 Continuous airworthiness	**Certified Max Gross Wt.:**	129500 lbs
Time Since Last Inspection:	127 Hrs	**Engines:**	2 Turbo fan
Airframe Total Time:	17589 Hrs	**Engine Manufacturer:**	CFM International
ELT:	Not installed	**Engine Model/Series:**	CFM56-3B
Registered Owner:	International Lease Finance Corporation	**Rated Power:**	20000 Lbs thrust
Operator:	Continental Airlines Inc	**Operating Certificate(s) Held:**	Flag carrier (121)
Operator Does Business As:	Continental Airlines	**Operator Designator Code:**	CALA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	DFW,603 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	10:56 Local	**Direction from Accident Site:**	0°
Lowest Cloud Condition:	Few / 3000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Broken / 15000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	20°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.05 inches Hg	**Temperature/Dew Point:**	27°C / 22°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	CLEVELAND, OH (CLE)	**Type of Flight Plan Filed:**	IFR
Destination:	DFW Airport, TX (DFW)	**Type of Clearance:**	IFR
Departure Time:	08:50 Local	**Type of Airspace:**	Class B

Airport Information

Airport:	Dallas/Fort Worth Int'l DFW	**Runway Surface Type:**	Concrete
Airport Elevation:	603 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	18L	**IFR Approach:**	None
Runway Length/Width:	13400 ft / 200 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	5 None	**Aircraft Damage:**	None
Passenger Injuries:	55 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	60 None	**Latitude, Longitude:**	32.896389,-97.037498

Administrative Information

Investigator In Charge (IIC):	Wigington, Doug
Additional Participating Persons:	Abigail A Smith; NTSB; Washington, DC Ralph C Holiday; FAA FSDO; DFW Airport, TX J. Duncan E Monaco; FAA AAI-100; Washington, DC Thomas R Wayson; National Air Traffic Controller's Association; DFW Airport, TX Kennith E Pender; Delta Airlines; Salt Lake City, UT Evert J Sinon; Continental Airlines; Houston, TX
Original Publish Date:	May 30, 2003
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this incident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=53035