The 1987 Maryland train collision occurred at 1:30 pm on January 4, 1987, on Amtrak's Northeast Corridor main line in the Chase community in eastern Baltimore County, Maryland, United States, at Gunpowder Interlocking, about 18 miles (29 km) northeast of Baltimore. Amtrak train 94, the Colonial (now part of the Northeast Regional, from Washington, D.C., to Boston), crashed into a set of Conrail locomotives running light, and which had fouled the mainline. Train 94's speed at the time of the collision was estimated at about 108 miles per hour (174 km/h). Fourteen passengers on the Amtrak train were killed, as well as the Amtrak engineer and lounge car attendant.

The Conrail locomotive crew failed to stop at the signals before Gunpowder Interlocking, and it was determined that the accident would have been avoided had they done so. Additionally, they tested positive for marijuana. The engineer served four years in a Maryland prison for his role in the crash. In the aftermath, drug and alcohol procedures for train crews were overhauled by the Federal Railroad Administration (FRA), which is charged with rail safety. In 1991, prompted in large part by the Chase Maryland crash, the United States Congress took even broader action and authorized mandatory random drug-testing for all employees in "safety-sensitive" jobs in all industries regulated by the U.S. Department of Transportation (DOT) including trucking, bus carriers and rail systems. Additionally, all trains operating on the high-speed Northeast Corridor are now equipped with automatic cab signalling with an automatic train stop feature. Several safety issues were identified with Amfleet cars as well.

At the time, the wreck was the deadliest in Amtrak's history. It was later surpassed in 1993, during the wreck at Big Bayou Canot in Alabama that killed 47.

Movements of the trains pre-collision

Amtrak Train 94

Amtrak Train 94 (the Colonial) left Washington Union Station at 12:30 pm (Eastern time) for Boston South Station. The train had 12 cars and was filled with travelers returning from the holiday season to their homes and schools for the second semester of the year. Two AEM-7 locomotives, numbered 900 and 903, led the train; #903 was the lead locomotive. The engineer was 35-year-old Jerome Evans.

After leaving the Baltimore, Maryland Amtrak station, the train's next stop was Wilmington, Delaware. Just north of Baltimore, while still in Baltimore County, the four-track Northeast Corridor narrows to two tracks at Gunpowder Interlocking just before crossing over the Gunpowder River. The train accelerated north toward that location.

Conrail light engine move

Ricky Lynn Gates, a Penn Central and Conrail engineer since 1973, was operating a trio of Conrail GE B36-7 locomotives light (without freight cars) from Conrail's Bayview Yard just east of Baltimore bound for Enola Yard near Harrisburg, Pennsylvania. Gates was later determined to have violated several signal and operating rules, including a failure to properly test his cab signals as required before departure from Bayview. It was later discovered that someone had disabled the cab signal alerter whistle on lead unit #5044 with duct tape, muting it almost completely. Also, one of the light bulbs in the PRR-style cab signal display had been removed. Investigators believed these conditions probably existed prior to departure from Bayview and that they would have been revealed by a properly performed departure test.

Gates and his brakeman, Edward "Butch" Cromwell, were also smoking a marijuana cigarette. Cromwell was responsible for calling out the signals if Gates missed them, but failed to do so.
The collision

As Amtrak Train 94 approached the Gunpowder Interlocking near the Chase community on the electrified main line, the three Conrail freight locomotives were moving north on one of the adjacent freight tracks. Before the adjacent tracks reached the bridge at the river, they merged into the two through tracks that cross the bridge.

While the tracks and interlocking plant at this location are signalized to alert locomotive engineers when the interlocking switches are set for through track train movement, the switches are not designed to de-rail a locomotive or train that runs through them when they are aligned for through track train movement.

In the case of the accident, the interlocking plant was properly set for through track movement only, so as to allow the Amtrak train to pass the freight locomotives (which should have been stopped on the side tracks) on the through tracks onto and over the bridge. The freight locomotive engineers ignored the stop signals in their locomotive cab (which were muted), and at trackside, visible to them from the cab of their locomotive.

Speed/event recording devices indicated that the Conrail locomotives were moving at approximately 60 miles per hour (97 km/h) when their brakes were applied for an emergency stop, after they had passed the trackside signals. This was, Gates later claimed, when he realized that he did not have a wayside signal to proceed north at the interlocking. He was, however, moving too fast to stop before passing the signal indicating he should stop clear of the main track on which #94 was approaching.

Had Gates reacted either to an approach signal instructing him to reduce speed, or to the stop signal itself in a timely fashion, or had the brakeman called out the state of the signals as he was supposed to do, it was likely the Conrail engines could have stopped short of the switch.

The Conrail locomotives came to a stop on the track directly in front of #94, which approached the interlocking a speed between 120 and 125 mph (193 and 201 km/h). Although the maximum allowed speed for Amtrak AEM-7 locomotives carrying cars on this corridor was 125 mph, #94 was carrying one 'Heritage' style passenger car, whose maximum allowed speed was limited to 105 mph (169 km/h). The conductor for #94 testified that he did inform the fatally injured train engineer of the Heritage car on the train; in any event, its presence meant that the Amtrak train was speeding. With little time to react, Amtrak engineer Evans apparently saw the diesels on the line in front of him and
applied the brakes for an emergency stop. The NTSB determined that even if #94 had been travelling at 105 mph (169 km/h), the Amtrak's authorized speed limit, the collision was unavoidable at this point.

On impact, the rearmost Conrail diesel, GE B36-7 #5045 exploded and burned. It was completely destroyed down to the frame and was never rebuilt. The middle unit, #5052, sustained significant damage to the front but was later rebuilt and returned to service. Lead unit #5044 had little damage.

One of Amtrak's AEM-7s, #900, was buried under the wreckage, while the lead locomotive, #903, ended up among some trees on the west side of the right of way. Several Budd Company Amfleet cars were piled up, with some crushed under the pile.

Cromwell, who was on the lead locomotive with Gates, suffered a broken leg in the collision. Gates was uninjured. The Amtrak engineer, lounge car Lead Service Attendant and 14 passengers were killed.

The front cars on the Amtrak #94 train suffered the greatest extent of damage and were almost completely crushed. However they were nearly empty awaiting additional holiday passengers en route who would have boarded the train at stations further north. According to the NTSB, had these cars been fully occupied at the time, the death toll would have been at least 100. There were relatively few passengers on those cars, however, and so the death toll was much less. Most of the dead were on Amtrak car #21236.

**Post-collision response and cleanup**

With a total passenger load of about 600 people, there was a great deal of confusion after the collision. Witnesses and neighbors ran to the smoking train and helped remove injured and dazed passengers, even before the first emergency vehicles could arrive at the location.

While many of the injured passengers were aided by nearby residents, some of the uninjured passengers wandered away, making it difficult for Amtrak to know the complete story.

Emergency personnel worked for many hours in the frigid cold, impeded as they were by the stainless-steel Amfleet cars' skin's resistance to the ordinary hydraulic rescue tools at their command, to extricate trapped passengers from the wreckage as helicopters and ambulances transported injured people to hospitals and trauma centers. It was over 10 hours after the collision before the final trapped people were freed from the wreckage.

It was several days before the wrecked equipment was removed and the track and electrical propulsion system were returned to service.

**Investigation, charges and conviction**

At first, Gates and Cromwell denied smoking marijuana. However, they later tested positive for the substance. A National Transportation Safety Board investigation revealed that had Gates slowed down at the signals as required, he would have stopped in time. It also determined that Gates and
Cromwell’s marijuana use was the "probable cause" of the accident. Gates and Cromwell were immediately suspended by Conrail pending an internal investigation, but resigned rather than face certain termination.

Gates was eventually charged with manslaughter by locomotive; under Maryland law a locomotive is a motor vehicle. Prosecutors cut a deal with Cromwell in which he agreed to testify against Gates in return for immunity. Gates was sentenced to five years in state prison and one year’s probation, and was later sentenced to an additional three years on federal charges of lying to the NTSB. Gates’ history of DWI (driving while intoxicated) convictions as well as his admission that the crew had been using marijuana while on duty led for a call to certify locomotive engineers as to their qualifications and history.[3]

Toxicology tests on the Amtrak engineer’s body returned negative. In a 3-2 decision, the NTSB report stated that the speed of train #94 at the time the brakes were applied, between 120 and 125 mph (193 and 201 km/h), was an unauthorized excessive speed, since the maximum for an Amtrak train carrying Heritage cars was 105 mph (169 km/h). The excessive speed was determined to have been a contributing factor to the amount of damage to both trains at the point of impact. The two dissenters to the report believed that it was unreasonable to assign contributory blame to the Amtrak engineer based solely on the premise of the Heritage car lowering its speed limit.[2]

Gates was released from prison in 1992 after serving four years (two years of a state sentence, then two more years of a federal sentence), and now works as an abuse counselor. In a 1993 interview with the Baltimore Sun, Gates said the accident would have never happened if not for the marijuana. He also revealed he had smoked marijuana on the job several times.[3]

Changes for future prevention[edit]

As a result of the wreck, all locomotives operating on the Northeast Corridor are now required to have automatic cab signalling with an automatic train stop feature. Although common on passenger trains up until that time, cab signals combined with train stop and speed control had never been installed on freight locomotives due to potential train handling issues at high speed. Conrail subsequently developed a device called a locomotive speed limiter (LSL), a computerized device that is designed to monitor and control the rate of deceleration for restrictive signals in conjunction with cab signals. All freight locomotives operated on the Northeast Corridor must now be equipped with an operating LSL which also limits top speed to 50 mph (80 km/h). Previously, freight locomotives were only required to have automatic cab signals without an automatic train stop feature.

Also as a direct result of this collision, federal legislation was enacted that required the FRA to develop a system of federal certification for locomotive engineers. These regulations went into effect in January 1990. Since then, railroads are required by law to certify that their engineers are properly trained and qualified, and that they have no drug or alcohol impairment motor vehicle convictions for the five-year period prior to certification. Another effect was that age-old Rule G (The use of intoxicants or narcotics by employees subject to duty, or their possession or use while in duty, is prohibited. — UCOR, 1962) was revamped to:

An employee who reports for duty under the influence of alcohol or other intoxicant, cannabis in any form, an amphetamine, a narcotic, a hallucinogenic drug, any controlled substance (as defined by federal law), or a derivative or combination of any of these, or who uses any of the foregoing while on duty, will be dismissed. Possession of any of the foregoing while on duty, or possession, use, or being under the influence of any of the foregoing while on Company or occupying facilities provided by the Company is prohibited. Source: Tennessee Valley Railroad Operating Rules book, effective March 15, 1995

Actually, a form of Rule G has existed in many railroad operating manuals for decades. However, the federal codification of this rule was deemed necessary to assure that any violator would be dealt
with in a consistent and harsh manner. Also, anyone who passes a stop signal loses his or her FRA certification for a period not less than 30 days for a first offense. This is per 49 CFR part 249.

In 1991—prompted in large part by the Chase crash—Congress authorized mandatory random drug-testing for all employees in "safety-sensitive" jobs in industries regulated by DOT.

Memorials[edit]

Ten years after the collision, the McDonogh School of Owings Mills, Maryland decided to build a 448-seat theater in memory of one of the crash's victims and alumna, 16-year-old Ceres Millicent Horn, daughter of American mathematicians Roger and Susan Horn. Ceres Horn graduated from McDonogh at age 15 and enrolled and was accepted at Princeton University at age 16 where she majored in astrophysics.

On January 4, 2007, the 20th anniversary of the crash, her family visited the theatre for the first time and attended a ceremony at the McDonogh School held in honor of their daughter.[4]

The Baltimore County Fire Department's medical commander at the scene 20 years earlier told the newspaper that the Amtrak crash is still being used as a case study in effective disaster response. "The reason is how the members of the professional and volunteer fire departments and the community people got together." It was, he said, "a very sad but a very proud moment" in his career.[5]

See also[edit]

- 1996 Maryland train collision, also involving Amtrak
- Hinton train collision, similar accident in Canada the previous year in which a freight disregarded signals and collided head-on with an intercity passenger train; the freight's crew was also found to have adversely impacted mental capacity (in their case due to insufficient rest and the engineer possibly having a heart attack or stroke) and had disabled safety features as well.

References[edit]

2. Jump up^ National Transportation Safety Board. "NTSB Rail Accident Report RAR-88-01" (PDF).
5. Jump up^ Responders, Residents Recall Deadly Maryland Train Crash — (EMSSponder.com)

External links[edit]

- Picture of AEM-7 Amtrak #903 in Wilmington, Baltimore after the crash - http://www.railpictures.net/photo/78276/
- Media related to 1987 Maryland train collision at Wikimedia Commons
1987 Maryland train collision

Aerial view of the Colonial after the accident

Date: January 4, 1987
Time: 1:30 PM
Location: Chase, Maryland
Coordinates: 39°2′35″N 76°21′25″W
Country: United States
Rail line: Northeast Corridor
Operator: Amtrak
Conrail
Type of incident: Collision
Cause: Engineer error, Noncompliance with stop Signal, excessive speed preventable by ATP/ATC and other safety measures

Statistics

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CHASE, MD. — Federal investigators requested drug and alcohol tests on the dead and surviving train crewmen and on a train dispatcher Monday as they focused on human error as a possible cause of the high-speed Amtrak collision that left 15 dead.

An Amtrak passenger train, en route from Washington to Boston and packed with more than 610 holiday travelers, collided with a train of three locomotives Sunday afternoon near this small suburban community outside of Baltimore. Some 176 persons were injured in what has become the worst accident in Amtrak’s history.

Officials said it was clear the three-locomotive train, operated by Conrail, the national freight service, was on the wrong track, but members of the National Transportation Safety Board said no one yet knows why.

The investigators were seeking clues from voice transmission and mechanical cassette recorders Monday while rescuers, working under white arc lights for a second night, extracted the last bodies from the wreckage of Amtrak Train 94 on an isolated siding.

Joseph Nall of the NTSB said that in addition to the routine blood and urine tests for the crewmen, they also were studying the possibility of a switching malfunction. That investigation, however, has been hampered by the heavy bulk of the locomotives and passenger cars that covered the raised railbed and the crucial switching gear.

Three large cranes Monday tried to untangle the remains of Amtrak’s Colonial train that tore into the three diesel locomotives. Many of the 12 passenger coaches were put back on the track, but the crews were unable to search the last passenger compartment until late Monday afternoon.

``There is no sign of life left in the cars,`` said Baltimore County Police Maj. Robert Oatman, but he added that state police bloodhounds were to be brought out to check the madly twisted passenger compartments.
"The freight locomotive should not have been on the track. The signals appeared to be working," said John Jacobsen, Amtrak`s director of public affairs. When asked if it was a case of human error, he replied, "That appears to be a good possibility now."

Nall said that while both trains were equipped with two-way radios on the same frequency, it was not yet known if their crews communicated, and analysts have not yet transcribed the tapes.

Another major avenue of investigation is through the "pulse event recorders" -- cassette machines that automatically monitor the train`s speed, horn, electrical power and throttle movement. The recorders are similar to airliner "black boxes" used to unravel the cause of plane crashes.

"This is the first occasion where recorders were used on both trains in a major accident," said Nall, adding that searchers had not yet found the Amtrak recorders but did have three recorders from the Conrail engines.

"The focal point of our investigation is when the Conrail train was on the second track, whether it was entirely on or partially on, and how they got there," said Nall.

Switching at that location is controlled by a dispatcher in Philadelphia and is usually done by remote control, he said. It is technically possible but unlikely that it could have switched on its own, he added.

Federal Railroad Administration head John Riley said Monday on "The McNeil-Lehrer Report" on public television that officials believed the freight train moved out from the siding "milliseconds before the arrival of the passenger train onto the tracks."

"What I mean is the distance in time between the Conrail train moving onto the tracks and the point of impact was perhaps a second or less," said Riley.

More than 610 passengers were on the unreserved Washington-to-Boston train and 176 of them were taken to Baltimore area hospitals. Police said 78 were seriously injured.

By Monday evening 14 of the dead had been positively identified, Oatman said. Pathologists were using photographs, fingerprints and jewelry to identify them.

Baltimore County Police official Jay Miller said the last survivor was taken from the wreckage after midnight Sunday.

The Amtrak engineer, identified as Jerome Evans, 36, of Carney, Md., was killed in the crash.

"My understanding is that the engineer, when he realized he was going to hit the other train, jumped at the last minute just as a desperate gesture," said Amtrak`s Jacobsen. "My impression is that he hit just about everything he could hit."

Riley said that based on observations, officials believe the engineer had no time to react, and we`ll be able to confirm that with certainty as we examine the tapes."
Hundreds of volunteer firemen and police officials worked into their second day Monday and construction workers built a small access ramp up to the elevated railbed to help clear wreckage.

Train service north of Baltimore was blocked, delaying between 10,000 and 15,000 travelers, said Jacobsen.

Amtrak hopes to restore limited service between Washington and Philadelphia Tuesday. Jacobsen said that officials hope to rebuild one track but that it would take two or three days before regular service was restored. Ironically, President Reagan's 1988 budget message to Congress Monday included a request to sell Amtrak.

CHASE, Md. -- Here are thumbnail sketches of the 15 people killed in Sunday's wreck of the Amtrak train Colonial:

- Train engineer Jerome Evans, 36, of Carney, Md., was called a 'very conscientious engineman' by his fellow engineers. The soft-spoken Evans worked on various railroad jobs for about 14 years and had been assigned to the Amtrak Colonial since October. He is survived by his wife, Denise, and a son and a daughter.