# NCAR-Led Applied Technology Insertion into Aviation Operations

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(Founding) Director of RAP

1981-1995

# Technology Transfer to Mitigate Threat to Aviation from Microbursts

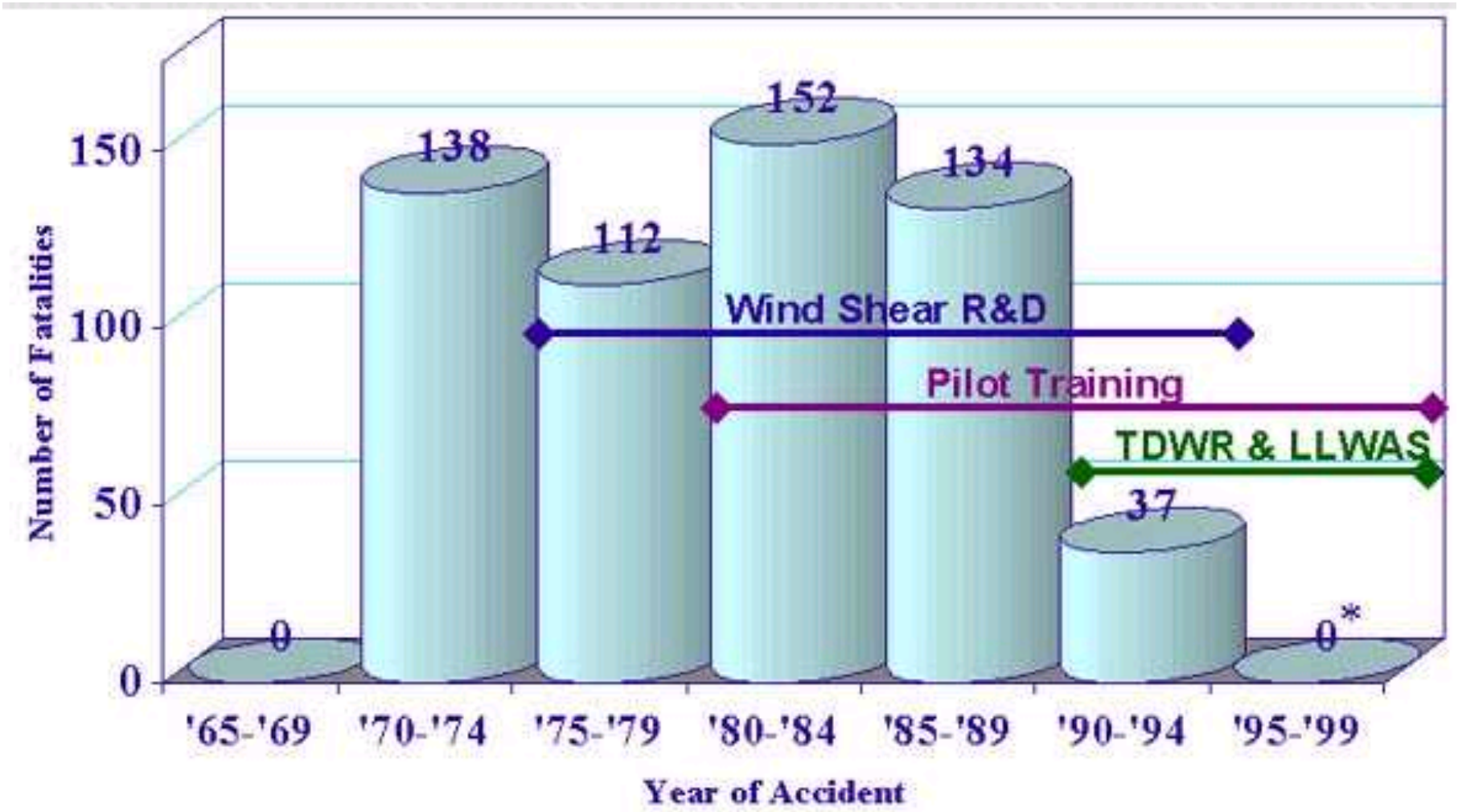
- Enhancing the Low Level Wind Shear Alert System (E-LLWSAS) from a six station system to a 32 station system (locations varied on number of sites depending on airport configurations)
- The Terminal Doppler Weather Radar(TDWR), dedicated initially to microburst detection
- Development primarily by NCAR and MIT Lincoln.
- At some sites TDWR was integrated with the Enhanced LLWAS for better detection capabilities

# Continued

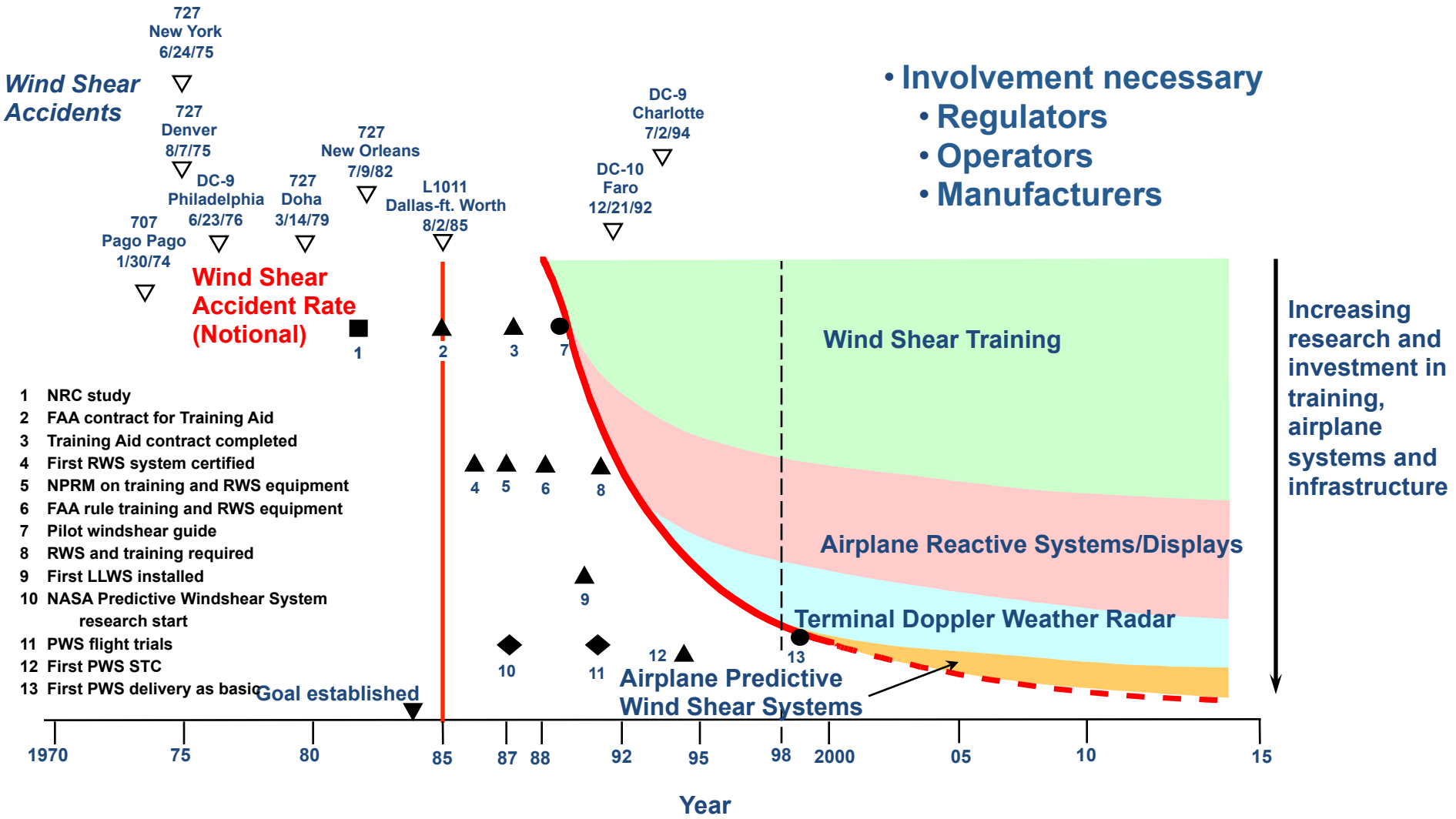
- 45 TDWR systems were installed by the FAA, and an additional 33 Wind Shear Weather Processors, developed by MIT, were installed, bringing the number of ground-based Doppler radars to 78 total at major airports believed to be at greatest threat of microbursts
- Assisted private sector and NASA development of airborne, forward-looking microburst detectors using Doppler radars.

# Continued

- Assisted the FAA, along with Boeing, United Airlines, Lockheed, and Douglas, in developing the Wind Shear Training for airline pilots. It is now a standard training program for all airline pilots in the world, not only by FAA but by airlines under the UN International Civil Aviation Organization (ICAO). Since all air carrier pilots use this training, the concepts go with them world-wide, and are not tied to ground detection systems.


Number of Fatalities
150
100
50
0
138
112
152
134
37
0
0*
Wind Shear R&D
Pilot Training
TDWR & LLWAS
'65-'69
'70-'74
'75-'79
'80-'84
'85-'89
'90-'94
'95-'99
Year of Accident

# Reducing the Accident Rate
# A Model for Success: Wind Shear Accidents

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# We need to do it again … and we have a process to help us do it

*Industry and Government Working Together*