

LIGHTNING COSTS AND LOSSES FROM ATTRIBUTED SOURCES

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Compiled by the National Lightning Safety Institute, www.lightningsafety.com

NLSI research suggests realistic USA lightning costs and losses may exceed \$8-10 billion per year. (Accurate information is elusive or in error: US Dept Commerce reports lightning property damage at \$48 million!) Verified sources which describe lightning's economic consequences include:

1. FIRES.

- 1.1 Forest Fires. In 2010 there were 7164 lightning-caused fires destroying 2,119,275 acres. *National Interagency Fire Center, 2010.*
- 1.2 Fires To Structures. 18% of all lumberyard fires and 30% of all church fires are lightning-related. *Ohio Insurance Institute, Columbus OH.* From 2007 to 2011, 58% of all residential lightning fires happened during the months of July and August. *National Fire Protection Association, 2012.*

2. INSURANCE INDUSTRY REPORTS.

- 2.1 State Farm homeowners (residential only) insured losses were \$969,000,000 per year; average cost per claim was \$6,400 (not including deductibles). There were 151,000 claims. Alabama, Tennessee and Texas were the top three claims states. *State Farm Insurance and Insurance Information Institute, NY Claims Journal, July 26, 2013*
- 2.2 Lightning is responsible for more than \$5 billion in total insurance industry losses annually, according to Hartford Ins. Group. www.tmcnet.com on the web Sept 14, 2006
- 2.3 On annual average, we pay out about 3-4% of our claims as a result of lightning. *Factory Mutual Companies.*

3. STORAGE AND PROCESSING ACTIVITIES.

- 3.1 Looking specifically at storage and processing activities lightning accounts for 61% of the accidents initiated by natural events...in North America 16 out of 20 accidents involving petroleum products storage tanks were due to lightning strikes. *Journal of Hazardous Materials 40 (1995) 43-54*
- 3.2 In a study of 242 accidents to industrial storage tanks over 40 years, 74% occurred in petrochemical facilities. 80 accidents (33%) had been caused by lightning. *Jrnl of Loss Prevntn in Process Ind., 01/06*
- 3.3 Thirty percent of US businesses suffer damage from lightning storms. *Carnegie Mellon Report, 02/06*

4. ELECTRICAL UPSETS TO INFRASTRUCTURE.

- 4.1 Some thirty percent of all power outages are lightning-related on annual average, with total costs approaching one billion dollars. *Ralph Bernstein, EPRI ; Diels, et al.*
- 4.2 Utility company nuclear power plant digital and I&C equipment safety feature activations were initiated by lightning in 19% of the cases. *US Nuclear Regulatory Commission, NUREG/CR-6579.*
- 4.3 Collision of trains on the High Speed Rail Network, Wenzhou China, 27 July 2011. Signal switching equipment failed due to lightning strike. 40 killed, 192 injured. *New York Times 27/07/2011*

5. PETROCHEMICAL INDUSTRY, Downstream Costs Due to Lightning/Fire/Explosion. *Willis Energy Market Review, 12/13.*

- 5.1 USA : Texas Refinery \$95,000,000; Louisiana Refinery \$104,000,000.
- 5.2 Non-USA: Rhineland-Palatinate Petroleum \$68,800,000; Alberta Oil Sands \$1,070,000,000; Singapore Refinery \$153,000,000.

6. MINING INDUSTRY, (*miscellaneous examples cited from Google searches.*)

- 6.1 South African South Deep JV mine lost 1 month production due to lightning & flooding (2005).
- 6.2 Porgera JV mine in Papua New Guinea had a severe lightning strike shutting down 50% of electrical power for more than 3 months at a production loss of \$750,000/day (2006).
- 6.3 A Tennessee smelter pot line is "frozen" by a lightning-induced electrical outage. 164 pots have to be dug out by hand. Production is shut down for 7 weeks (2007).
- 6.4 Twelve miners killed by lightning-caused methane gas explosion. (West Virginia, 2005)

7. EFFECTS OF LIGHTNING IN FUTURE YEARS?

- 7.1 If the theory of global warming is correct, "we could see double or triple, even more, in the number of lightning strikes by mid-century." *Dr. Martin Uman, Univ. Florida Lightning Research Center, from New York Times 9/9/01.*
- 7.2 Chinese scientists have warned that global warming is likely to intensify extreme weather patterns, and severe storms in recent years may be a prelude to this. *China Meteorological Administration, 07/07*
- 7.3 Each degree of global temperature increase results in 10%-20% higher incidence of lightning. *Osmar Pinto Junior, ELAT, National Institute for Space Research (INPE), Brazil, 12/02/10*