



ENGINEERING AND CONSTRUCTION CLAIMS AND INSURANCE TRENDS

Engineering insurance is a highly specialized class of insurance that covers the world's largest construction projects, including airports, high speed rail links, power plants and manufacturing complexes. Such projects are typically very high value – the largest are in the tens of billions of dollars – and can run for many years, even decades. **Allianz Global Corporate & Specialty (AGCS) identifies eight emerging developments around engineering and construction risks.**

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HIGHER VALUES BRING BIGGER LOSS IMPACT

Given the busy nature of construction sites, claims are frequent. But when that site is a hydroelectric plant or an oil and gas facility, claims can be extremely expensive and complex. Flooding of the Hidroituango hydropower dam in Colombia in 2018 during construction is currently projected to cost insurers almost US\$1.4bn,¹ making it one of the largest engineering claims in history.

Large engineering and construction projects have changed beyond recognition in recent decades, leading to much higher values and increased complexity. Such projects are typically very high value – the largest are in the tens of billions of dollars – and can run for many years, even decades. The expansion of [Al Maktoum International Airport](#) in Dubai, for example, will not complete until 2030 and is expected to cost \$36bn. London's Crossrail project, currently Europe's largest infrastructure

project, will take over 10 years to build at a cost of over [£17bn](#) (\$21bn).

"Construction sites today are much larger than in the past. Whether it is a power plant, refinery or car manufacturing plant, projects are now typically much larger and higher value. And with more and more technology and sophisticated machinery in factories and offices, values per square meter have also increased significantly," says **Raymond Hogendoorn, Global Head of Property and Engineering Claims at AGCS**.

As a result, sums insured are now much larger – an engineering or construction project with an insured value of \$5bn to \$10bn is not unusual. "Whatever the cause, construction claims today are typically in the tens of millions of dollars, where before a loss of \$10mn would have been an exception. Any loss is therefore much more likely to have a bigger impact," says Hogendoorn.

¹ The Insurance Insider, Ituango Dam Loss \$1.2bn And Rising, October 2018 and various reports



FIRE AND EXPLOSION TOP CAUSE OF LOSSES. NATURAL CATASTROPHES MOST SERIOUS RISK CONCERN

Fire is the biggest cause of loss for engineering claims, accounting for over a quarter (27%) of losses by value, but just 7% by volume based on analysis of more than 13,000 claims worth almost €8bn or \$8.8bn (see *graphic below*). Fire has caused in excess of €2.1bn of insurance losses over a five year period.

“Fire and explosion claims remain the biggest cause of loss due to the high values associated with engineering and construction projects today. There hasn’t been a change in the frequency of fire claims, but when they happen, the impact is much higher,” says Hogendoorn.

Natural catastrophes are another source of large engineering claims. For example, storm damage is the

second single biggest cause of loss by number, accounting for one in 10 claims. Natural catastrophes are also ranked the top concern for engineering and construction firms in the **Allianz Risk Barometer 2019**, which quizzes more than 2,400 global risk experts about their major worries for the year ahead. (see *page 5*).

This is a reflection of elevated activity, with major losses from US hurricanes and wildfires, as well as floods and storms in Asia occurring in recent years. In fact, recent years are among the most expensive in the past 30 years for catastrophe losses – [2018](#) was the fourth-costliest year in terms of insured catastrophe losses, while [2017](#) was the second most expensive, according to Munich Re.²

DEFECTIVE PRODUCT AND QUALITY CONTROL LOSSES ON THE RISE

While natural catastrophes have grabbed the headlines in recent years, design defects and poor workmanship have risen to become leading causes of engineering claims. Defective products are the single biggest source of engineering claims by frequency, and the second largest by severity, according to AGCS claims analysis (see *graphic*). Accounting for 27% of engineering claims, there are almost three times as many defective products claims as storm claims, the next largest cause of engineering claims by frequency.

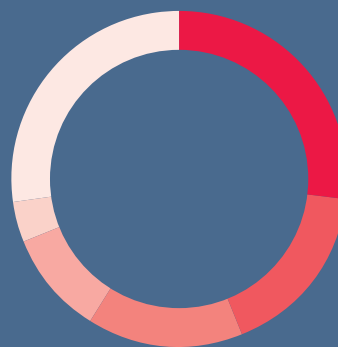
“We are seeing an increase in claims related to defects and quality control across the board,” says **Dr Martin Eckel, Senior General Adjuster, Global Claims Key Case Management at AGCS**.

“For example, we recently have had two major power generation claims — \$200mn events — caused by defective welding.” Another example of defective design and workmanship led to a landslide at a hydroelectric plant in Latin America.

² Munich Re, The Natural Disasters of 2018 In Figures, January 2019

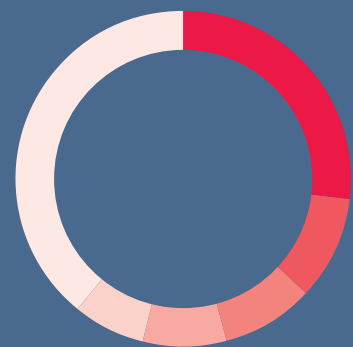


TOP CAUSES OF LOSS ENGINEERING CLAIMS



By value of claims

● Fire/Explosion	27%
● Defective products	17%
● Faulty workmanship/maintenance	15%
● Storm	10%
● Water damage	4%
● Other	27%



By number of claims

● Defective products	27%
● Storm	10%
● Faulty workmanship/maintenance	9%
● Water damage	8%
● Fire	7%
● Other	39%

Source: Allianz Global Corporate & Specialty (AGCS).

Based on analysis of 13,599 insurance industry claims between July 2013 and July 2018 with an approximate value of €7.9bn

Loss total includes the share of other insurers in addition to AGCS.

Fire is responsible for more than a quarter (27%) of the value of all engineering insurance losses.

Together, defective products and faulty workmanship account for more than a third (36%) of all engineering claims.

GREATER SUPPLY CHAIN COMPLEXITY INCREASING SIZE AND COST OF CLAIMS

Large construction projects today are far more complex, with many more contractors and longer supply chains. In the past, an airport or a power plant would most likely have been built in the US or Europe by a national contractor using local suppliers. Today, it is more likely to involve multiple parties with machinery, equipment and other components sourced and transported from around the world, explains Eckel.

“We are seeing much higher levels of organizational and supply chain complexity, and this is feeding through to the cost of claims. With so many parties involved, and with growing cost pressures, quality assurance today is not always as good as it once was,” says Eckel.

Longer supply chains and more specialist machinery also affect the size of engineering claims. For example, an oil and gas installation being built in Europe or the US would most likely require hundreds of modules to

be manufactured in China, Korea and Thailand, transported to the site and then assembled. This introduces additional risks, explains Eckel.

Many projects today are too large for a single contractor, but by increasing the number of parties involved in a project, project management and quality assurance is becoming a bigger challenge. Extended supply chains also create exposures – boilers, turbines and other machinery now has to be transported greater distances, increasing the risk of damage or delay, explains Eckel.

“With higher values and more complexity we are seeing some very large claims. Technology is becoming more sophisticated and specialized, which can increase the costs to repair or replace machinery and equipment. If a turbine coming from China is damaged in transport, it might take as long as 18 months for a repair,” says Eckel.

NUMBER OF BUSINESS INTERRUPTION/ DELAY IN START-UP CLAIMS GROWING

Business interruption (BI) claims have also emerged as an important driver for engineering claims as customers have sought to protect revenues and as insurance coverage has broadened. Construction and engineering firms ranked BI as the second most concerning risk behind natural catastrophes in the **Allianz Risk Barometer 2019**, (see page 5).

Growing awareness of BI exposures has seen an increase in construction and engineering firms buying BI covers, in particular delay in start-up (DSU) insurance, which covers delays to construction or engineering projects following physical damage. DSU claims are usually expensive – indemnity for delay in start-up has increased from around \$200,000 per day to up to \$500,000 per day over time.

“We see more large delay in start-up claims as demand for DSU cover and limits have increased as projects have grown larger and as operational values have increased. As the stakes have gotten higher, DSU limits have increased, and so have claims. At the more extreme end, DSU claims can now be as high as \$2bn,” says Hogendoorn.

BI is also influencing engineering claims through higher repair costs, according to Eckel: “Brokers have sought to build-in cover to speed up repairs, which can drive up the cost of engineering claims. In a bid to mitigate BI, construction and engineering firms are seeking to speed up repairs for property damage, but this can double the cost of a property claim.”

POLITICAL RISK AND SANCTIONS A GROWING CONCERN FOR LONG-TERM PROJECTS

Political risk is another factor influencing engineering claims, and a risk of growing concern for businesses. Changes in regulation and legislation, including political risks like trade wars, sanctions and Brexit, was ranked the third most concerning risk by engineering and construction firms in the **Allianz Risk Barometer 2019**, (see page 5).

Large construction projects can take as long as five to 10 years to complete and involve contractors and suppliers from around the world, making them vulnerable to

sanctions and trade disputes. For example, sudden and large increases in US import tariffs can add millions of dollars to claims for equipment and machinery imported from countries such as China.

The increased use of economic and trade sanctions by the US and Europe also has implications for claims and the ability of insurers to operate or service clients in some countries and sectors. For example, economic sanctions can narrow the options to source equipment and machinery, potentially increasing the cost of a claim.

GROWTH OF RENEWABLE ENERGY PROJECTS BRINGS CHALLENGES AS WELL AS BENEFITS

The fast growing renewable energy market is an exciting yet challenging area for the engineering sector and its insurers. As the demand for green energy has increased solar and wind projects have become larger, the locations more remote and wind turbines much bigger.

Renewable energy produced in [the EU](#) increased by two thirds between 2007 and 2017, and is expected to reach 20% by 2020.³ Wind power was, for the first time, the second most important contributor to the renewable energy mix, accounting for 13.8% of total renewables. In 2018 alone, there were [409 new offshore wind turbines](#) across 18 projects.⁴ Offshore wind, where AGCS is a leading insurer, can be a particularly challenging area for

claims. Located out at sea, offshore wind turbines are difficult to access, requiring drones and certified adjusters to assess damage.

Offshore wind innovation is also moving fast. Wind turbines are getting larger – the [latest models](#) are 260 meters high and have blades as long as a football pitch. The size of windfarms is also increasing – for example, the UK's Hornsea Project One offshore wind farm, set to become the world's largest, will have over 170 turbines in operation when completed next year. As wind farms get larger, the impact of serial defects is greater, leading insurers to increase deductibles for losses that affect more than five turbines.

INCREASING ROLE OF DRONES AND NEW TECHNOLOGY IN RISK AND CLAIMS ASSESSMENT

As large engineering and construction projects have become more complex, involving many contractors and suppliers, risks and subsequently claims can become much more difficult to assess and establish the ultimate cause of loss. However, insurers have an increasing array of new technology at their disposal that can increase certainty for engineering risk and claims assessment, as well as improving overall service.

For example, AGCS recently used drones, laser scanning and computer modeling to carry out root cause analysis of a machinery explosion. The site, inaccessible to loss adjusters, was first explored by a drone, while a 3D laser scanner and computer modeling then simulated the explosion to establish the cause of the loss.

Drones and satellite imagery also helped to assess engineering claims after recent natural catastrophes, such as wildfires in California and Hurricane Florence in 2018. This enabled loss adjusters to get a quick overview of damage, as well as assess claims in hazardous or inaccessible areas.

Together with the geodata factory of engineering firm IABG, AGCS has also developed a new kind of flood risk survey based on topographic data from drones in order to model flood and drainage behavior on construction sites. Preparation work on construction sites can change

site elevations and often disrupt natural water courses and drainage, creating obstacles such as the build-up of water during heavy rainfall meaning flood exposures can change throughout the course of construction activities. By coupling 3D topographical data with hydrogeological modelling software and rainfall simulation data it is possible to assess water flow across a construction site and predict flash flooding risk.

At the same time, satellite technology is proving particularly useful for engineering claims, offering high resolution images of a site within 24 hours of a loss. It can give adjusters information on engineering risks in remote or hazardous locations, as well as provide data to tackle exaggerated or fraudulent claims. For example, AGCS used satellite imagery to remotely monitor the construction of a hydro dam which then reported an incident. Adjusters were not able to visit the dam, but satellite data showed damage to the dam was not as extensive as claimed.

Technology will create more certainty for engineering claims, according to Hogendoorn: "There are so many parties on a site at one time, and so many activities happening simultaneously, it can be extremely difficult to understand the sequence of a loss event. However, we can increasingly use technology to access data and information to better understand the root cause of loss and speed up the claims process."

³ Eurostat, Renewable Energy Statistics, January 2019
⁴ Wind Europe, Offshore Statistics, February 2019

ALLIANZ RISK BAROMETER 2019



TOP 5 RISKS IN ENGINEERING, CONSTRUCTION, REAL ESTATE

Source: Allianz Global Corporate & Specialty.
 Figures represent how often a risk was selected as a percentage of all responses for that industry sector. Responses: 211. Figures don't add up to 100% as up to three risks could be selected.

Rank		Percent	2018 rank	Trend
1	Natural catastrophes (e.g. storm, flood, earthquake)	40%	1 (45%)	=
2	Business interruption (incl. supply chain disruption)	33%	2 (40%)	=
3	Changes in legislation and regulation (e.g. trade wars and tariffs, economic sanctions, protectionism, Brexit, Euro-zone disintegration) NEW	26%	-	▲
3	Market developments (e.g. volatility, intensified competition/new entrants, M&A, market stagnation, market fluctuation)	26%	5 (21%)	▲
5	Fire, explosion	23%	3 (29%)	▼

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Photos: Adobe Stock/Shutterstock
August 2019



ABOUT ENGINEERING INSURANCE

Unlike traditional property insurance, engineering is a single overarching policy protecting property, plant and equipment for the whole project, covering the project owner, main contractor and subcontractors. The policy, a combination of property, machinery breakdown and liability coverages, goes beyond construction risks and typically includes the transit of materials to site, and can include delay in start-up (DSU), a form of business interruption cover.

For more information visit
agcs.allianz.com/solutions/engineering-insurance.html