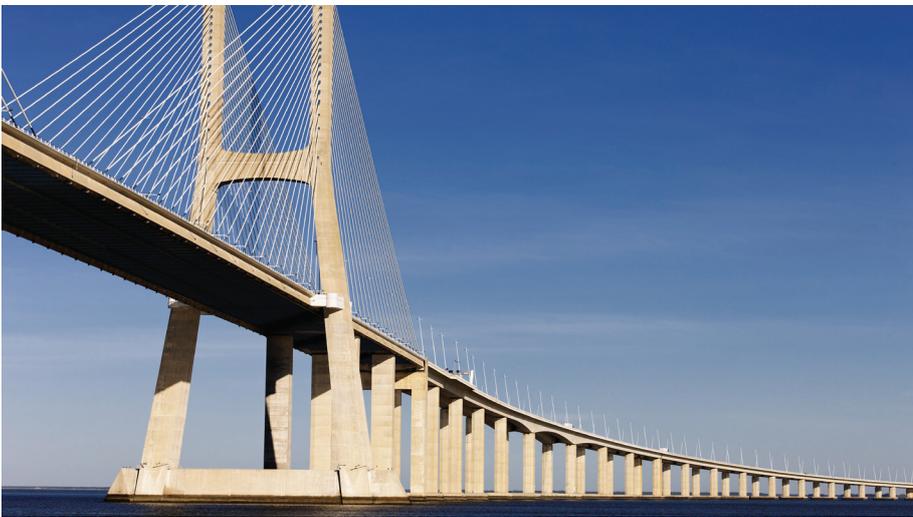




Protecting Man's Feats of Engineering

Major earthquake and flood events from recent years have highlighted the exposure potential of infrastructure to natural hazards. Accidents, such as collision or explosion, can be equally destructive. Civil Engineering Completed Risks (CECR) insurance protects completed infrastructure against these and other risks. Gero Stenzel, Senior Underwriter Facultative Engineering, reviews CECR, including important underwriting considerations from PartnerRe's facultative engineering team.



A growing line

Demand for CECR is on the increase as a consequence of the ever greater involvement of private investment in infrastructure, together with higher risk awareness and other factors such as climate change. This is an insurance cover with continued growth potential, but where particular care is needed given the high exposures involved, risk of anti-selection and multi-disciplinary expertise required for risk evaluation.

CECR fundamentals

CECR is an annually renewable insurance for completed civil engineering structures, in most cases where fire is not the predominant exposure. It primarily covers massive concrete structures, e.g. roads, tunnels, bridges, dams, canals, harbours, transmission lines and runways, as opposed to manufacturing or residential/commercial facilities.

CECR indemnifies the insured for repair/replacement costs following unforeseen and sudden material loss or damage to the insured property. The cover was initially offered only on a "named perils" basis, but is now also available on an "all risks" basis, depending on the market and/or market cycle. Natural catastrophe events are generally considered to be the main risk, although some structures, e.g. tunnels, are highly exposed to fire. Many contracts are now extended to include consequential loss (business interruption).

Parties involved

Insureds for this class of business are typically public authorities, joint ventures, public private partnerships (PPPs), private finance initiative (PFI) contractors and other investors. Ownership can be complex and must be clearly specified. Insurers and reinsurers support this cover principally through a mix of coinsurance and facultative and treaty reinsurance structures, varying substantially by risk and market.

Scope of cover

For a named perils cover, the usual perils are:

- Impact of landborne or waterborne vehicles or aircrafts or articles dropped therefrom
- earthquake, volcano, tsunami
- storm (wind speeds above 75km/h)
- flood or inundation
- subsidence, landslide, rockslide or any other earth movement
- frost, avalanche, ice, snow
- vandalism by individual persons
- fire, lightning, explosion



Figure 1: In January 1980, the Tjörn Bridge in Sweden was hit by a vessel during fog. The impact caused the collapse of the main 220m span of the bridge.



Figure 2: Fast and high waters can undermine piers and abutments, weakening a bridge to the point where collapse is imminent. Shown, the storm surge from Hurricane Katrina in August 2005 destroyed the Biloxi Bay Bridge, U.S.

The cover may be extended to include:

- debris removal
- expediting costs
- machinery breakdown
- strike, riot and civil commotion
- terrorism
- consequential loss (separate business interruption section)

CECR all risk covers usually specify exclusions. Standard exclusions include:

- loss or damage caused by or aggravated by latent or inherent defects
- mechanical or electrical breakdown of machinery or electronic installations
- wear and tear, corrosion, erosion, normal settlements
- wilful acts or negligence
- war
- nuclear risks



Figure 3: Repair costs to the Mont Blanc Tunnel after the fire in March 1999 totalled approximately € 189 million and business interruption approximately € 203 million¹².

Sum insured

For risks that are transferred from the engineering project phase to the operational phase, the project sum insured (from the construction all risks, CAR, policy) is usually taken as the sum insured for the CECR policy. However, for existing, rather than newly built, structures, setting the sum insured is particularly challenging and important. In order to avoid underinsurance, the total sum insured should not be less than the full cost of replacement (new replacement value).

Indemnification is for repair or replacement, but does not include costs for improvements, e.g. to replace with a different structure or structure with a higher capacity. The new replacement value will depend on the age of the insured property and fluctuating costs linked to area, technologies and the materials used.

It is common practice to establish a loss limit (each and every loss and/or an annual aggregate) for the material damage exposure, particularly in locations with a high natural catastrophe exposure.

Underwriting considerations

Anti-selection is a major threat to a sustainable CECR portfolio.

It is essential to consider that each risk is unique, necessitating a separate risk assessment and specific policy terms and

conditions. Risk assessment is based on detailed technical information (including inspection reports, see below) from the insured, loss information and long-term assessment of the catastrophe exposure.

Maintenance and benefit of standardized inspections

The underwriter must be convinced that the policy is not being used as a substitute for regular maintenance and overhaul.

Regular maintenance and inspections are necessary for all man-made civil engineering structures to mitigate damage or loss of function. This can present challenges to the insured on the technical and financial side, especially in a weak economic climate, but is critical. To ensure that proper maintenance is taking place, insurers establish standardized, systematic and regular inspection procedures by specialized agents (risk engineers).

An expert partner for CECR risk

Assessing and evaluating CECR risk requires underwriting and risk expertise from multiple disciplines, including engineering, geology, seismology and meteorology. PartnerRe is a global, multi-line reinsurer with long-term expertise in these functions. Our facultative engineering team has the experience and know-how to underwrite CECR and to offer this technically challenging cover to clients.

¹ Cost estimates: IRC archive: <http://archive.constantcontact.com/fs037/1102467289629/archive/1102628131209.html>
² Image source: <http://www.chamonet.com>