

**The Institution of Structural Engineers (Caribbean Division)
The Pan American Health Organisation
Conference on
Safe Hospitals and Other Critical Facilities
June 2009**

**The Use of Check Consultants
in
Design and Construction**

**Tony Gibbs
Consulting Engineers Partnership Ltd**

**Hurricane Luis
in
Dutch Sint Maarten
and
French Saint Martin**

Dutch side (Netherlands Antilles Meteorological Service):
Highest gust 99 knots or 51 ms⁻¹

French side:
No anemometer measurements
available

Dutch side:
Catastrophic damage
- 100% GDP direct
- 100% GDP indirect

French side:
Not much damage

Regulatory Regime on the Dutch side:

- a variety of standards
 - * Dutch
 - * home base of designer
 - * other “equivalent” standards
- checking by PWD
 - * normally by in-house staff
 - * rarely by hired consultants

Regulatory Regime on the French side:

- French standards or “norms”
- *bureau de contrôle* checks:
 - * design
 - * construction quality assurance mechanisms

Dutch side:

A wide range of standards

French side:

“We have to do it right.”

The differences outlined by those familiar with construction on both sides of the border include:

- * Better attention to conceptual design on the French side;
- * Greater consistency and uniformity of standards of design for earthquakes and hurricanes on the French side;
- * The involvement of *bureaux de contrôle* on the French side.

The *bureaux de contrôle*:

- * Independent firms licensed by the state
- * Pay well and attract, and keep, some of the best talent
- * Check designs and also make occasional site visits during construction
- * Involvement in projects is necessary if decennial (10-year) insurance cover is to be obtained [Spinetta Act of 1978]
- * Lending agencies also demand the certification of a *bureau de contrôle*.

Peter Rice's book: The Engineer Imagines

"It is no accident of time that both the La Villette and IBM projects first appeared in France where there exist the most intelligent and knowledgeable checking authorities that I have come across. The large centralized controlling offices, *bureaux de contrôle* (Socotec, Veritas, CEP and others), each have at their head engineers who are equal in ability to any I have encountered in the best design offices, as Centre Pompidou amply demonstrated." - page 113

Peter Rice's book: The Engineer Imagines

"Others not so closely involved must also be asked to review the project, to question the assumptions and demand explanations. The presence of a competent, dedicated and sceptical checking authority is also very important in this respect." - page 123

Other Countries

- * United Kingdom - dams, tunnels and bridges
- * Germany - *pruf ingenieurs*
- * Japan - advocates and review jury
- * Mexico City - engineers licensed by exam for 3 years
- * California
- * Vancouver
- * Colombia - *diseñador* (the designer) and *interventor* (the checker for client) and *curador* (checker for government)

**Consulting Engineers Partnership Ltd Projects
Reviewed by Check Consultants:**

- * Central Bank of Barbados
- * Intel Factory – Phase II
- * ALICO Building
- * 3 Chelston Buildings (2 built) for
Manufacturers Life Insurance Co
- * British High Commission Offices
(Barbados and Trinidad)
- * Eastern Caribbean Central Bank

**CEP Ltd for PresTcoN
Atlantic LNG Train-4 Jetty-2**

4 layers of checking:

- * Internal at CEP
- * Bectel
 - Strict adherence to the standards quoted in the contract
 - Approval of variations through expert opinions
 - Specifications for calculations, approval of software and hardware
- * Independent engineers hired by Bectel
- * Insurers

Atlantic LNG Train-4 Jetty-2



Roles of the Review Consultant

- 1 To assist a design consultant in achieving a better and more reliable project by providing independent assessments of the work
- 2 To reduce the incidence of errors or of unsatisfactory designs and construction
- 3 To identify sub-standard work (vital for the fundamental well being of the project, for the protection of the client and for providing security for the funding agency and insurance underwriter)
- 4 To assist in the development of the construction industry

Consequences of Introducing the System

- * Better information on the hazards
- * Improved standards documents
- * More appropriate conceptual designs leading to lower construction costs
- * Improved quality of tertiary education for architects and engineers
- * Better organised post-graduation formation of professionals
- * Self-financing CPD programmes

In some other walks of life the independent reviews of professional opinions are valued. Here is an example from the medical profession:

“When one of my patients gets a second opinion, only two things can happen and they are both good. Either I am right, or the other doctor finds something I didn’t diagnose and the patient comes out ahead.”

Richard A Wherry, MD