

# Discussion: Eurocodes, 1970–2010: why 40 years?

**Roger Paul Johnson** MA, FEng, FICE, FISTu  
Emeritus Professor of Civil Engineering, University of Warwick,  
Coventry, UK

**David Lazenby** CBE, DIC, FICE, FStructE  
Past President of the Institution of Structural Engineers, former Chair of  
CEN TC250, leading the Eurocodes.

**J B Menzies** FEng  
Engineering Consultant, UK

## Contribution by D. Lazenby

The contributor would first like to congratulate the author on producing a very useful record of the background to this great technological saga, and some of the frustrations encountered and lessons learned (Johnson, 2009).

The contributor also warmly endorses a number of fundamental points about the Eurocodes, which he considers are worth re-emphasising because they are critical to a full understanding of the story.

- The great driver for this epic work was *political*, as a vital part of the realisation of the ‘European dream’, including the lifting of trade barriers within the common market. From the earliest stage, when there was great scepticism in the UK, this contributor was personally quite clear that it would all be pursued to completion *with or without* UK participation. But because the UK would be obliged to adopt them anyway, participation was essential!
- The Eurocodes are hugely important, both as the state-of-the-art design codes, and as a part of European harmonisation and mutually advantageous technical development.
- The Eurocodes are not only destined to be unavoidable within Europe as a whole and environs, but they are increasingly influential and adopted in the rest of the world. This should be advantageous to many parts of our industry.

During his years as a consulting engineer, and perhaps even more in later years leading BSI as a Director of British Standards, the contributor came to learn how technology, and technical expertise, cannot stand alone, but *must* be harnessed and managed effectively – the temptation is even to say manipulated – if it is all to be practical, implementable and beneficial.

Having become involved in the development work in the early 1980s, in the prescient group of like-minded UK engineers watching over the UK’s interests and input in those early days which the author has reviewed, this contributor shared the frustrations and irritations. History was to show these would accompany the work throughout. It became clear that this work could only be carried through to a successful conclusion if it was moved on from the useful foundations laid by the specialist professional groups in Europe which had started on it by placing it into an organisation which would be more effectively linked

into the European Commission (which would inevitably come to be the ‘client’ and partial paymaster). When the work was indeed eventually transferred into CEN, the contributor was vice-chairman of the head steering committee, in the expectation of taking over the leadership from his distinguished German predecessor within 3 years. He was supported in this strategy by the UK government department and BSI.

The contributor remained in the chair until the year 2000, when the role as director of British Standards was creating some possible conflicts, so the chair then passed to another eminent German. Reflecting on those years, the UK’s interests, as well as the successful outcome of the whole exercise, were well served by key roles being played by a number of leading UK engineers, to whom the country is indebted. Had the UK not been represented, imagine how different it all would have been, and how unfamiliar and difficult the Eurocodes would now be. The UK would undoubtedly suffer because the Eurocodes would still be found to be unavoidable!

The contributor’s emphasis has been on the necessity for the work not only to be on a sound technical basis, but also informed by ‘political’ practicalities. By this is meant a preparedness to understand the political, social, financial and personal pressures which influenced the work. As chairman, it was necessary to pay great attention to these aspects, in order to lead the enormous team across Europe (of over 2000 at its peak) to make good progress and achieve the mutual goals. This can be illustrated by looking back on some illuminating, and sometimes amusing, episodes, which might help convey the pressures.

- (a) When the working structures (the steering committee, sub-committees, working groups, secretariats, liaison engineers, etc.) were being established in 1990, it was clear to this contributor that a crucial step would be the appointment of the chairmen and secretariats of each of the ten sub-committees, and perhaps even some of the key working groups. A reasonable spread had to be achieved across the major active nations, while reflecting where particular expertise lay. A draft allocation of all these posts was drawn up (not an easy task!), but then the problem was to achieve agreement of the experts, national government representatives and the national standards bodies, all of which were under scrutiny and pressure back at home. At the

plenary meeting in Berlin in 1990 the draft arrangements were explained, and inevitably there was a good deal of murmuring and some competitive dissent. That evening the hosts had arranged a dinner for all the 100 or more participants (plus a number of accompanying persons), on a boat on the waterways of the city. The contributor was convinced that a long night of discussion and socialising, *with no chance of escape*, could resolve most of the difficulties. The chairman and the contributor spent the hours negotiating with many of the personalities, but had not cleared every point by the time the cruise was due to finish. The contributor, therefore, asked the skipper of the boat not to return the group to base until he was given the 'all-clear'. By an hour or so later it seemed that the convivial atmosphere, and the time spent understanding the various characteristics and strengths of the key players, had worked its magic. The contributor gave the skipper the word to return to land! The enforced togetherness had succeeded (and not for the last time!).

(b) Chairman, he sensed that the eventual adoption and success of the Eurocodes would be heavily influenced by the degree of involvement of each of the national standards bodies, and indeed national governments. If they were to feel remote or detached from the development, they would not be inclined to support it, or commit adequate resources to the production and later maintenance of the Eurocodes.

The contributor, therefore, arranged that the 6-monthly steering meetings (attended by the technical experts, participants from national governments and standards bodies, CEN and the European Commission – often more than 100 in all) should move around as many countries as possible. At first there was apprehension over the logistics, and even the cost to the various hosts. But it was soon clear that each host benefited from exposing the work to their own professions, and it became almost competitive to handle the meetings efficiently, and host the fine accompanying social events, which were vital in overcoming frictions and cementing tough agreements. Not only did the work benefit, but this contributor is sure that everyone learned a great deal about Europe, technically and politically.

The contributor remembers one meeting in a beautiful capital city which was just emerging from behind the iron curtain (50 years of darkness, as they described it). At the principal dinner the group was entertained by a marvellous string quartet of men in their later years. When the time came for the contributor to announce thanks on behalf of the group, he discovered that one of the quartet was a professor of nuclear physics, one of astrophysics, one of mathematics and one of civil engineering. During the long 'dark' years they had kept themselves sane by playing music – a telling reflection of those times.

(c) It is well known that the academic world can be competitive, but it was interesting to observe how one or two continental universities fell over themselves to capture particular work (sometimes funded) in order to bolster their teaching profile,

and perhaps even the personal profiles of those involved. Even when overloaded they were reluctant to yield any work to others, so programme management became an exercise in persuasion and strong-arm tactics!

(d) The relationship with the European Commission was obviously crucial in sustaining political and financial support. The paper explains how early misunderstandings about the nature of the work led to great frustration over both progress and costs. As the author has illustrated, there were great struggles over the years before the migration into CEN. So the contributor inherited a rather frosty relationship with the Commission, and cannot claim that everything then proceeded smoothly, because there were certainly numerous tough debates and negotiations. But in reflecting on the huge investment which the Commission did then make, and how it was necessary to help them handle the work in ways which suited their processes, the contributor is content that his own very frequent visits to Brussels really did pay dividends, and they were softened by the many good personal relationships there.

The contributor warmly welcomes Roger Johnson's valuable paper, which provides a good record of the technical procedures, and the multi-faceted problems which inevitably arose. With such a huge undertaking, these were probably unavoidable. The contributor hopes that he can underline the reality that the very good technology was supported by strong and intelligent management, and that this will help to fill in the full picture of the political, professional and social aspects of this great undertaking.

### Contribution by J. B. Menzies

Professor Johnson's paper gives a good description of the unavoidably tortuous process of preparation of the Eurocodes and of the many questions not foreseen at the outset that had to be resolved during the course of the work. Not only was the work without precedent, but also it was undertaken largely by representatives of the member states whose first languages were different and who were largely undertaking the work additionally to their main employment. In hindsight it is not surprising that preparation of the Eurocodes took a long time.

The author gives little information about the Eurocode for Actions. This contributor's comments below aim to provide more background.

In 1984 the Eurocode Coordination Group decided that a study should be undertaken to determine the feasibility of preparing a Eurocode for Actions. Previously, representatives of member states considered that a Eurocode for Actions could not be prepared. A small task group was set up to advise on steps needed, and the Building Research Establishment (BRE) was requested by the European Commission to undertake an enquiry among the member states. The BRE report on the enquiry concluded that the preparation of a Eurocode for Actions was

feasible, and proposed an outline of 20 Eurocode parts covering permanent, variable and accidental actions. The report was accepted by the Coordination Group and the preparation work began. The resulting Eurocode for Actions, EN 1991, is broadly in line with that originally proposed.

At the outset of preparation of the Eurocode for Actions, the contributor was appointed Chairman of the sub-committee overseeing the work. Initially the work was under the aegis of the Commission, and interpretation of the meetings in five languages was necessary. Progress was very slow. However, member state representatives had been meeting for some years to discuss Eurocodes and a good spirit of cooperation had developed. It had become evident that English was by far the most widely understood and spoken language among the representatives. Following a proposal from non-English speaking representatives, it was agreed to conduct all future meetings and to prepare first drafts of papers in English. Progress was thereby greatly facilitated.

Another key agreement facilitating progress was that principles and rules proposed for inclusion in Eurocode drafts should be based on scientific principles rather than on current practice in particular member states. This agreement eliminated much fruitless debate and led to more direct focus on scientific evidence.

During the preparation of the Eurocode several issues arose where it appeared that harmonised principles and rules could not be developed. It always proved possible to move forward following scrutiny and analysis of available evidence. The Eurocode for Actions that has emerged is, in this contributor's view, superior in many respects to the national codes that it has replaced. This outcome has been possible only through the goodwill and dedication of the many representatives who undertook the work.

### Author's reply

Behind David Lazenby's discussion lies his immense and sustained effort to persuade the European Commission to continue funding the work on Eurocodes. Its reluctance contributed to the widespread belief that they would be abandoned, which is why informed comment on drafts was so sparse. This discussion is being published in the year that the relevant committees of CEN have formed 'Evolution Groups' to revise the codes.

He noted that the Eurocodes are 'increasingly influential... in the rest of the world'. This will only continue if an efficient process for their revision can be found. So far, there is little sign of this. In 2011, the relevant committees of CEN formed 'Evolution Groups' to revise the codes, with a target date of 2019 for the completion of drafts. This is predictably as optimistic as were the many target dates to which the paper refers. The work is under-resourced. Neither the European Union nor potential users are as willing to provide time and effort as is the academic community. Its input, although of value for widening scope, tends to increase length and complexity. Some way must be found to further encourage those with the most experience of using the codes in practice to make constructive proposals for their revision.

Much of the paper is based on first-hand experience with the Eurocodes for concrete and steel structures, so the contribution from John Menzies on Eurocode 1, on loadings, is most welcome. The interval of over a decade between the start of work on the Eurocodes and the discovery that rules for 'Actions' were needed illustrates again the limited understanding at that time of the task ahead. Is it possible to do better today?

### REFERENCE

- Johnson RP (2009) Eurocodes, 1970–2010: why 40 years? *Proceedings of the Institution of Civil Engineers – Structures and Buildings* **162(6)**: 371–379, <http://dx.doi.org/10.1680/stbu.2009.162.6.371>.