Сущность методики заключается в итерационном процессе статического расчета системы с переменной податливостью узловых соединений. Процесс подбора величины податливости узла заканчивается при совпадении с заданной степенью точности угла поворота узлового соединения, полученного в результате численного расчета стержневой системы с экспериментальным значением.

При данной методике можно непосредственно описывать в виде отдельных элементов стержневой системы и измерительные приспособления. Численный анализ изменения податливости узлового соединения в координатах момент - угол поворота позволяет получить предельный момент в узле в виде четко выраженного экстремума. Данная методика показала удовлетворительные результаты при численном анализе экспериментальных данных испытаний рамных систем, выполненных J.Szlendakom в Белостокской политехнике.

Uniform Classification System for any Beam-to-Column Connection

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In the 70's and especially in the 80's the loading response of frames with partial-rigid connections was extensively studied. These studies led to the conclusion, that the traditional model of joint behaviour should be replaced by more advanced models So, in a design process of the particular structure for any moment we need to know the following data about proposed connections:

a) What are their initial (secant, tangent) stiffnesses?

b) What are their elastic loads?

c) What are their ultimate loads?

d) What are their rotation capacities ?

The first three of these are necessary to calculate the serviceability and ultimate load limits . The fourth ensures stress distribution and the safe working of joints. The uniform classification system (UCS) developed by the author is one possible approach, Fig. 1 The solution to this problem is not obvious. However, the development of a classification system for different connections seems to be the path we ought to follow The basic concept was presented a few years ago (EC-3 1992, Bjorhovde, Brozzetti, Colson 1990, Szlendak 1995). Research efforts are focused on the easy transformation of a particular connection to a uniform one, which could be recognized by numerical procedures. Some information is available from practice. Very often the geometry of the structure has already been decided by the architect if not in a direct then in an indirect way. Reasonable dimensions of beams and columns are not difficult to establish and in the preliminary design the steel grade is usually assumed. This basic information about a steelstructure framework is enough to define its uniform connections.

This system is suitable for any beam-to-column connection.

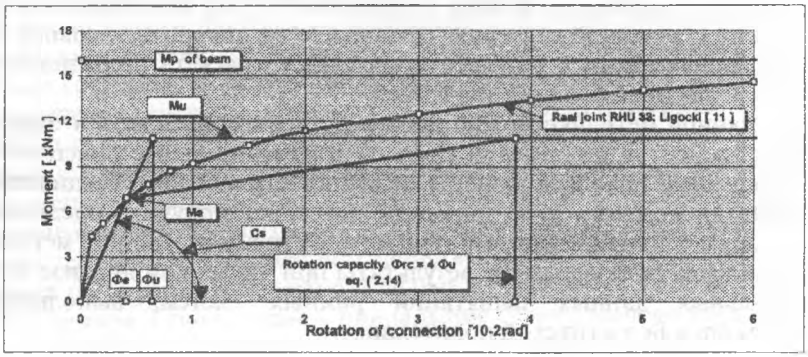

Fig. 1 Uniform classification system (UCS)

where: C_c - initial stiffness of connection, C_s - secant stiffness of connection, M_e - elastic load of connection, M_p - plastic moment of beam section, M_u - ultimate load of connection, Φ_e - elastic rotation = M_e / C_s, Φ_u - ultimate rotation = M_u / C_s, Φ_{rc} - rotation capacity = $k \Phi_u$, k - rotation capacity coefficient, = 4 for RHS sections, or = 6 for seismic requirements.