The main products of this Commission are the Suggested Methods (SMs) documents which the ISRM generates in order to provide guidance on the measurement of rock properties, both in the laboratory and on site. Professor John A. Hudson had previously been responsible for the Commission since 1987. After his election as ISRM President for the period 2007-2011, Professor Resat Ulusay from Turkey took over this responsibility on February 2006.

The annual Commission reports of 2003, 2004 and 2005 were prepared by Professor J.A. Hudson for presentation in South Africa, Kyoto and Brno, respectively. Professor Resat Ulusay presented the last report in November 2006 during the 4th Asian Rock Mechanics Symposium (ARMS’4) in Singapore. Over the four years, the focus of the Commission has been on generating new SMs and updating existing SMs, and compilation of all the ISRM Suggested Methods in book form.

This report includes the four-year activities of the Commission between 2003 and May 2007. During this period the activities carried out by the ISRM Commission on Testing Methods are as follows.

2003 and 2004:

Because rock stress estimation is perceived to be of increasing importance in rock mechanics and rock engineering and because there has been considerable development in the subject area since 1987, emphasis was placed in these years on providing enhanced ISRM guidance through a new four-part set of rock stress estimation ISRM SMs. It was felt that it would be useful if these SMs were published with supporting papers to illustrate the many facets of understanding and measuring rock stress. Accordingly, seventeen supporting papers were prepared. The new SMs and supporting 17 papers, which discuss the manifold aspects of in situ stress occurrence and its measurement, were published together in a Special Issue of the International Journal of Rock Mechanics and Mining Sciences at the end of 2003 (IJRMMS, 41, 7-8). The four SMs on rock stress are:

Hence not only guidance is given through the SMs, but the SMs are supported by papers discussing the history of the subject, stress measurement experiences and associated issues. In this way, the ISRM provides engineers and researchers with a wealth of knowledge.

The Special Issue on Rock Stress Estimation has proved to be most successful and is a useful template for future subjects. For example, on 24 September 2004, a Fracture Mechanics Workshop convened by Professor Ove Stephansson was held in Potsdam, Germany, to discuss the generation of a new suite of fracture toughness SMs. This is to update the 1988 SM co-ordinated by Finn Ochterlony and the 1995 SM co-ordinated by Bob Fowell. The purpose of the Workshop was explicitly to formulate the group which will generate the new SMs and to consider how to develop supporting papers for a Special Issue on Fracture Toughness in the same style as the Rock Stress Estimation Special Issue. The Potsdam initiative was well received.

2005 – February 2006:

A new SM entitled “ISRM Suggested Method for Determining the Shore Hardness Value for Rock” was co-ordinated and written by R. Altindag and A. Gåney of the Department of Mining Engineering, Engineering and Architecture Faculty, Süleyman Demirel University, Isparta, Turkey. It updates and replaces the hardness section of the 1978 “Suggested Methods for Determining Hardness and Abrasiveness of Rocks” document produced by the ISRM Commission on Standardization Laboratory and Field Results (IJRMMGA, 1978, 15: 89-97). It was published in IJRMMS in 2006 (43, 19-22) and considered as a “Conditionally Accepted SM”.

Based on the outcome of the discussions at the Workshop in Potsdam (Germany) in 2004, two groups working on SMs for fracture toughness testing were established. The first group lead by Dr. Da’an Liu at Institute of Geology and Geophysics, Chinese Academy of Science, Beijing, took on the revision of existing Mode I Fracture Toughness Testing Methods. This work was started in early November 2004.

The second group concerning the new ISRM SMs for Mode II Fracture Toughness Testing, which is being co-ordinated by Ove Stephansson, was established in 2005 and started to work. At the start of this work, the co-ordinator suggested to work in three smaller groups, each one devoted to developing one SM for \( K_{\text{IC}} \). These groups consider the following testing methods:

1. Punch Through Shear (PTS) Testing: T. Backers (Group leader; Germany), E. Rybacki (Germany), S. Jeon (S. Korea), J. Yoon (S. Korea) and J. Kemeny (USA).
2. Shear Box Testing: Q. Rao (Group leader; P.R. China), S. Kou (Sweden) and R.J. Fowell (UK).
3. Triaxial Compression Testing: T. Hashida (Group leader; Japan), J. Napier (South Africa) and A. Vervoort (Belgium).
Over 25 years ago, the book “Rock Characterization, Testing and Monitoring: ISRM Suggested Methods”, edited by E.T. Brown, was published and contained all the SMs – up to the 1981 date of publication of the book. But it is firmly out of print. Elsevier have scanned in all copies of IJRMMS&GA and IJRMMD from 1964, so that all the ISRM SMs are currently available as pdfs from www.sciencedirect.com. Professor J.A. Hudson, as the previous President of the Commission, supplied the ISRM Secretariat with copies of these pdfs. However, many people had suggested to him that all the SMs should be re-published in hard copy book form so that they can easily be desk referenced with all the advantages of a book format. It was considered that in the case of its re-publication, this would be a major development for the ISRM and this Commission. Elsevier agreed that they could all be re-published; however this did not occur then because of rearrangements in the Book Department at Elsevier. The book has since been published as explained later in this report.

**February 2006-November 2006:**

Based on the streamlined system, suggested by Professor J.A. Hudson, the former President of the Commission on Testing Methods, and ratified by the ISRM at the Aachen Congress in 1991, an appointed lead person decides on the relevant review group for each new SM. After Professor Resat Ulusay was appointed as the President of the Commission by ISRM, and based on the advice of Professor J.A. Hudson, the establishment of a new set of Commission members was considered to be useful, since there should be truly international input to ensure that the ISRM SMs do indeed represent international views. Then a new set of Commission members was established. The following names, who have been invited by the President of the Commission, kindly accepted to be the members of the Commission and they were assigned by the ISRM Board in September 2006.

1) Dr. Robert J. Fowell (UK)  
2) Professor Ove Stephansson (Sweeden)  
3) Professor Yuzo Obara (Japan)  
4) Professor Xia-Ting Feng (China)  
5) Professor Hasan Gerçek (Turkey)  
6) Dr. A.K. Dhawan (India)  
7) Professor Gyo-Cheol Jeong (S. Korea)  
8) Dr. Jesse L. Yow Jr (USA)  
9) Dr. Eda Freitas de Quadros (Brasil)

*Ex Officio Members:*

10) Professor Nielen van der Merwe (President of ISRM 2003-2007)  
11) Dr. Claus Erichsen (IRSM Vice-President for Europe 2003-2007)

The Commission’s first meeting was held in Singapore on 7 November 2006 before the ARMS’4 Symposium. Y. Obara, X.T. Feng, O. Stephansson, E.F. Quadros and C.Erichsen, and J.A. Hudson as the former President of the Commission participated to this meeting.
The issues discussed and decisions taken during this meeting were as follows:

1. The procedure to be followed by the Commission for evaluation of new SMs and modification of any current SM was accepted
   a. Appointment of a reviewing group consisting of 2 or 3 experts to assess a new SM or to update a current SM,
   b. Circulation of the document, reviewed by the experts group and revised by its author(s), to the Commission members for their final comments,
   c. Acceptance of SM document and sending it to the ISRM Board for information, and
   d. Publication of the method in the IJRMMS as a new SM or a modified SM.

2. Based on the progress report written by Dr. Da’an Liu on behalf of the working group for the Mode I Rock Fracture Toughness Testing, the performance and interest of this group, and a number of difficulties particularly fund problems they reported, the Commission has decided that it seems considerably difficult to expect new progresses in this work, and therefore, there is no reason to encourage this group.

3. Based on the information from Ove Stephansson, who is the member of the Commission and also the leader of the working group established for Mode II Rock Fracture Toughness Testing, the work for this SM is going very well. A paper on the first part of the work has already been published. This group expects to complete the work in 2007 and plan to publish a technical note on the second half of the study in a journal. Then, depending on the response of the rock mechanics community to these publications, these papers will be combined as a SM for Mode II.

4. The new SM “ISRM Suggested Method for Determining the Shore Hardness Value for Rock”, which was co-ordinated and written by R. Altindag and A. Güney, and published in IJRMMS (2006, 43:19-22), was accepted as a “Suggested Method” and the term “conditionally accepted” is omitted. The authors of this SM were also informed by the Commission President about the final decision of the Commission.

5. Based on the discussion, the content of the microsite of the Commission will include the following items:
   a. List of Commission members (with correspondence and e-mail addresses)
   b. Annual and meeting reports of the Commission
   c. Revised SMs
   d. New progresses
   e. Terms of reference

6. Re-publication of all the SMs in a book (re-publication of the yellow book) was also considered during the meeting. John A. Hudson was still in discussion with Elsevier on this, and its re-publication seemed to be possible by Elsevier (Elsevier Geo-engineering Book Series). It was decided that in 2007, John A. Hudson and
Resat Ulusay would try to do their best for re-publication of this book which would include all the SMs (i.e. those accepted before and after 1981).

7. The Commission discussed future work particularly on possible new SMs and establishment of working groups for them. Titles of the new SMs and names of possible co-ordinators to be invited for each group were recommended by the Commission members.

Because the current SM on the Schmidt hammer test doesn’t even explain how to convert the rebound number into uniaxial compressive strength and Young’s modulus and given the recent work on this test by A. Aydin and A. Basu of University of Hong Kong, Professor Resat Ulusay invited Prof. Adnan Aydin to prepare a new SM for upgrading the Schmidt hammer tests and he accepted to take on this mission. In addition, the Commission recommended an outline to A. Aydin to be followed for this document.

November 2006-May 2007:

Based on the decisions taken by the Commission in Singapore, the following activities have been realized:

1. The new SM on the Schmidt hammer test has already been completed and submitted to the Commission by Professor Adnan Aydin. It was reviewed by the Commission’s President and then sent to two experts (Dr. Don Banks, USA and Professor Mete Göktan of Osmangazi University, Turkey) for reviewing. According to both reviewers, it is a well-prepared and comprehensive paper which will further improve the earlier SM provided by the ISRM; however, they would ask the author to address specific issues that they have raised before the paper can be further discussed by the Commission on Testing Methods of ISRM. Currently, the document is being revised by the author based on the reviewers’ comments. After the acceptance of the revised document by the reviewers it will be sent to the Commission members to take their final comments. The Commission hopes that this upgraded SM will be introduced to the rock mechanics community in 2007.

2. According to the report by Professor Ove Stephansson, the activities of the ISRM Working Group on $K_{IIc}$ of rocks are as follows. All the contacted members of the Working Group for $K_{IIc}$ have indicated an interest to participate in the work. The actual work in the Group is divided into three sub-groups: one on PTS testing lead by Dr. Backers at GFZ, Germany, one on Shear Box lead by Dr. Rao at Central South University in China, and finally triaxial compression lead by Dr T. Hashida, Tohoku University in Japan. Professor Ove Stephansson as the chairman of the Working Group has not been active in coordinating the work during the last 1.5 years. One reason is that there is a problem for the research teams to find founding for performing the tests and hence developing the Suggested Methods.
The activity within the PTS Group at GFZ is ongoing and they have just built new equipment which allows them to control the displacement of the central cylinder during testing. This is done by mounting a LVDT gauge at the bottom of the sample holder and let the signal from the LVDT enter the control system of the loading machine and steer the deformation of the central cylinder. Thereby, the stored and dissipated fracture energy can be determined and an energy based evaluation method can be used in determining the fracture toughness in shear. They now are prepared to run a couple of tests with the new equipment and present a Technical Note to the IJRMMMS. Thereafter they intend to write up a Suggested Method based on the published work in the IJRMMMS 39: 755-769 and the results presented in the Technical Note. This will allow testing according to two different phases; one simple and one more advanced method, similar to the present situation for testing fracture toughness in tension, $K_{IC}$. They intend to send the manuscript of the SM to all members of the Working Group for review and hope to complete the work with 2007.

3. One of the important issues the Commission discussed in Singapore was to establish new working groups to prepare new SMs and to upgrade some current SMs. By considering the new testing methods and the current SMs, which should be upgraded, on behalf of the Commission, the President sent invitation letters to some key persons to establish new working groups in March 2007. The title of these SMs and the key persons invited as the co-ordinator of each group, and the current situation are given below.

   a. **Upgraded SMs for determining shear strength both in field and laboratory**: Dr. Jose Muralha from LNEC, Portugal, has kindly accepted to be the co-ordinator of this group.
   
   b. **SMs on creep test**: Professor Ömer Aydan from Tokai University of Japan has in principle accepted to be the co-ordinator of this group. He will inform the Commission on the details, probably in May.
   
   c. **SMs for the determination of dynamic strength and deformation parameters of rocks**: Professor Jian Zhao from Lausanne, Switzerland (not responded yet)
   
   d. **SM for monitoring rock movements using GPS system**: Professor Norikazu Shimizu from Yamaguchi University of Japan (not responded yet).
   
   e. **SMs for the determination of fracture stiffness (normal and shear)**: Dr. Manfred Blumel from University of Graz, Austria (except asking questions, not clearly responded)
   
   f. **Upgraded SMs for sonic velocity tests**: Professor Michael S. King from Imperial College, UK was invited as the co-ordinator. But due to an important prior engagement that will keep him occupied during the summer, he is unable to accept. However, he promised that he would be prepared to serve as a member of such a working group. For this mission, Professor Adnan Aydin from the University of Hong Kong was invited and he accepted to be the co-ordinator of this group.
g. SMs for the quantitative description of discontinuities in rock masses:
   One of the main subjects that need updating is discontinuities since this hasn't been updated since the Nick Barton et al. one of 1979. Given the importance of the subject and the many developments since 1979, it now needs updating. Dr. John P. Harrison from Imperial College, UK, has accepted to be the co-ordinator of this group.

4. Robert J. Fowell, a member of the Commission, recommends a new SM on abrasivity testing. He considers that over the years a number of test methods have been proposed and it is time that simple and easily conducted tests are given the status of an ISRM Suggested Method. The obvious test in this regard is the French Cerchar Abrasivity Test. Other tests are the French LCPC tests. This should be a straightforward task as French standards exist for each test, though in his opinion require to be more detailed to avoid inconsistencies between different tests. R.J. Fowell will present a paper on this issue for the Lisbon Congress in July 2007. The Commission hopes this paper will indicate the way forward.

5. Based on the decision taken by the Commission during the first meeting in Singapore, re-publication of all the SMs in a book was one of the main targets of the Commission. In considering this, and as the recent and previous Presidents of the Commission, Resat Ulusay and John A. Hudson, respectively, obtained permission from the ISRM to be the co-editors of this book in January 2007. But due to continuing uncertainty with Elsevier in terms of re-publishing the ISRM's in book form, the co-editors decided to ask the ISRM Turkish National Group (TNG) to help in its printing. The TNG accepted to take the responsibility of its printing in Turkey on behalf of ISRM. Official permissions from Elsevier (for 39 SMs published in the IJRMMS) and Springer Verlag (for one SM published in Rock Mechanics) were obtained by J.A. Hudson and R. Ulusay, respectively. In addition, an agreement was also established between the ISRM and TNG. According to the agreement, the TNG undertakes publication of the book at its own risk and expense, and will negotiate the copyright. After the editorial works had been completed, the pdfs of all the SMs, that have been generated from 1974 to 2006, were compiled and printed in April 2007 in Ankara, Turkey, under the title

   “THE COMPLETE ISRM SUGGESTED METHODS FOR ROCK CHARACTERIZATION, TESTING AND MONITORING: 1974-2006”.

It is a hard cover book consisting of 628 pages and contains 40 SMs. The SMs are collated in the book in four parts, namely: Site Characterization, Laboratory Testing, Field Testing and Monitoring. Updated versions of triaxial compressive strength testing and the measurement of Shore hardness have been included in this compilation. It also has a preface by the ISRM President, Professor Nielen van der Merwe, an Introduction by the Co-Editors, Professor Resat Ulusay and Professor John A. Hudson, and a table of contents. The contributions of all those who have participated and assisted in the preparation of the SMs from 1974 to 2006 are acknowledged. The valuable assistance of the Turkish National Group is thankfully acknowledged for their kind support in the
preparation and printing of this compilation. The enthusiasm and support of Professor Nielen van der Merwe (ISRM President 2003-2007) and Dr. Luis Lamas (ISRM Secretary General), and the ISRM Board are also gratefully acknowledged.

Reşat ULUSAY
Commission President
27 April 2007
A List of all the ISRM Suggested Methods
(In chronological order)

SM for Determining Shear Strength - 1974
SM for Rockbolt Testing - 1974
SM for Determining Water Content - Porosity - Density - Absorption and Related Properties and Swelling and Slake-Durability Index Properties - 1977
SM for Monitoring Rock Movements Using Inclinometers and Tiltmeters - 1977
SM for Determining Sound Velocity - 1978
SM for Determining Tensile Strength of Rock Materials - 1978
SM for Determining Hardness and Abrasiveness of Rocks - 1978
SM for Determining the Strength of Rock Materials in Triaxial Compression - 1978
SM for Monitoring Rock Movements Using Borehole Extensometers - 1978
SM for Petrographic Description of Rocks - 1978
SM for Quantitative Description of Discontinuities in Rock Masses - 1978
SM for Determining in Situ Deformability of Rock - 1979
SM for Determining the Uniaxial Compressive Strength and Deformability of Rock Materials - 1979
SM for Pressure Monitoring Using Hydraulic Cells - 1980
SM for Geophysical Logging of Boreholes - 1981
SM for Surface Monitoring of Movements across Discontinuities - 1984
SM for Determining Point Load Strength - 1985
SM for Rock Anchorage Testing - 1985
SM for Deformability Determination Using a Large Flat Jack Technique - 1986
SM for Deformability Determination Using a Flexible Dilatometer - 1987
SM for Rock Stress Determination - 1987
SM for Determining the Fracture Toughness of Rock - 1988
SM for Seismic Testing Within and Between Boreholes - 1988
SM for Laboratory Testing of Argillaceous Swelling Rocks - 1989
SM for Large Scale Sampling and Triaxial Testing of Jointed Rock - 1989
SM for Blast Vibration Monitoring - 1992
SM for Determining Mode I Fracture Toughness Using Cracked Chevron Notched Brazilian Disc - 1995
SM for Deformability Determination Using a Stiff Dilatometer - 1996
SM for Complete Stress-Strain Curve for Intact Rock in Uniaxial Compression - 1999
SM for In Situ Stress Measurement Using the Compact Conical-Ended Borehole Overcoring (CCBO) Technique - 1999
SM for Laboratory Testing of Swelling Rocks - 1999
SM for Determining Block Punch Strength Index - 2001
SM for Rock Stress Estimation – Part 3: Hydraulic Fracturing (HF) and/or hydraulic testing of pre-existing fractures (HTPF) - 2003
SM for Land Geophysics in Rock Engineering - 2004
SM for Determining the Shore Hardness Value for Rock – 2006 (updated version)