NEWS & VIEWS

A New Technique to Boost Oil Recovery

Millions of extra barrels of oil may be recovered from the North Sea as a result of new drilling technology just tested by shell UK Exploration and Production in the East Shetland Basin.

According to the information available, the development provides a low-cost option for tapping small reservoirs and pockets of reserves that would otherwise have been uneconmic. The system involves feeding 50 mm diameter tubing from a coil down into an existing well. The tip of the tubing has a powered drilling bit which can be controlled and steered via wiring inside the tube. Unlike conventional drilling, the tubing assembly does not rotate, excepting the bottom drilling section.

A well just drilled in this way from a production platform in the Shell / Esso Brent field started off from an existing well some 3000 m below the sea bed. It then descended and traversed in a horizontal direction more than 460 m to access new reserves totalling some 500000 barrels of oil, which had previously been regarded as uneconomic to recover.

The new well, which is currently producing around 6000 barrels of oil a day, costs about half that of a conventional well. Such redrilling of a well by conventional means would have involved removal of all existing pipe sections from the hole whereas this is not necessary using the new system.

This is an extremely exciting development. Coiled tubing wells have been tried before to a limited extent in the North Sea, but this is by far the most successful application. It may well be a world record for offshore operations in terms of the length achieved using the technique.

It is reported that by drilling a number of coiled tubing wells over the next few years, it is possible to tap into another 10 or 20 million barrels.

-Technorama
I.E. (India), Oct., 1997

Trans-Asian Railway Chugging to Reality

One of the world's longest train rides a 15,000-km trek from Singapore to Scotaland is getting closer.

Planners and engineers are cobbling together the last links of a vast railways network that will link the far reaches of Asia and on to Europe.

About 1,950 km of rails remain to be laid in Asia and a railway tunnel is be be dug under the Bosporus Straits linking the European and Asian parts of Turkey before the four-decades-old dream becomes a reality.

When completed, the envisioned "Trans-Asian railway" will encompass two major East-West flows, both with rail links to South-East Asia.

The northern corridor will run from the Korean peninsula to Moscow and thereby to the eastern gates of Europe. A southern one will run from Bangladesh through the Indian subcontinent and Iran and on to Europe's southern entryway through Istanbul and the Bosporus Straits.

-Excerpts from the News,
The Times of India, Oct., 21, 1997

New Mountain

Chinese glaciologists have discovered a `new' mountain, the 15th highest in the world in the Xinjiang Uygur autonomous region. The 8,011-meter-high mountain, named `Zhongyang' is located at 35 degrees, 4 minutes north latitude and 76 degrees, 34 minutes east longitude. (reports Xinhua news agency).

This is a very important geological discovery and a new challenge for mountain climbers, according to Shi Yafeng, a glaciologist and academician of the Chinese Academy of Sciences (CAS).

-The Hindustan Times,
August 31, 1997

Long - life Concrete Coating

A concrete and masonry coating that is guaranteed to give 20 years protection has recently been developed by British engineers. According to the information avaialble, the accelerated weathering results from an independent assessment on a show house revealed no significant change to the coating after 14000h- equivalent to 28-30 years of external exposure.

The anti-carbonation properties of this coating make it particularly suitable for use on concrete. It has notable resistance to carbon dioxide and other acid gases; high water-vapour permeability; resistance to algae; alkali, oil and grease; adhesion greater than the cohesive strength of concrete; resistance to 3800 h salt spray; long-term scrub-resistance; and durability in adverse conditions; high ultraviolet resistance, dirt-repellent and blister proof properties.

-Technorma, Oct., 1997
The Institution of Engineers (India)

Conservation of Ellora Caves Under Way

The Archaeological Survey of India (ASI) has undertaken a massive structural and chemical conservation work of the famous Kailash temple of Ellora caves in Maharashtra, India to arrest the deterioration of the innumerable sculptures and paintings of the temple.

-The Times of India,
Oct. 20, 1997

NASA Plans Flying Power Stations

Giant orbital solar panels could start beaming power down to Earth within 15 years, according to NASA chief John Mankins, the manager of advanced concepts at Nasa. He said the system could end reliance on fossil fuels that damage the environment.

Called Suntower, the project uses an 8 km-high tower of solar panels orbiting the earth. The sun's energy is turned into microwaves and transmitted to receivers to Earth that turn them into electricity.

According to NASA's estimates, each tower could produce up to 400 megawatts of power-enough to power a small town-with dozens of solar panels able to orbit Earth at the same time. The towers would orbit Earth at a constant altitude of about 12,000 km.

-Excerpts from the News,
The Times of India,
Nov. 18, 1997

SQCC Lecture at University of Roorkee by Prof. G.N. Pande on Failure by Strain Localization

Prof. G.N. Pande delivered SQCC lecture on Applications of the Homogenisation Techniques in Soil Mechanics and Structure Masonry on 26th Sept. 1997 at University of Roorkee. Homogenisation technique is basically continuum characterization of composite materials. Prof. Pande cited facts that failure does not take place homogeneously in a material, but failure occurs by strain localization along shear bands, tension cracks in soils, rocks, concrete, masonry and necking in ductile metals. Prof. Pande showed that finite element method may be used to predict progressive failure by development of shear band successfully in a rock specimen. His theory of failure by strain localization is also shown to predict tension cracks in walls of brick masonry and very old bridges of brick masonry in U.K. The theoretical force displacement curve matches well with the experimental data even near collapse load.

Speaking on the enormous strength enhancement in rock masses around tunnels, Prof. Pande emphasized the key role of dilatancy along joints. There is constrained dilatancy in tunnels. So failure cannot take place along rough joints. Thus the mobilized strength of rock mass tends to be nearly equal to that of the rock material. In case of rock slopes, there is unconstrained dilatancy. The normal stress on joints is fixed due to small overburden. So the strength of rock mass in slopes is very low and equal that of the rock joints.

Prof. G.N. Pande is an International expert on Finite Element Method in Soil and Rock Mechaics. He is Professor in Civil Engineering, University of Swansea, U.K. He has won many International Awards.

Design of Civil Engineering Structures

The ability of a designer of continuous structures is measured chiefly by his ability to visualize the deformation of the structure under load. If he cannot form a rough picture of these deformations when he begins the analysis, he will probably analyse the structure in some aukward and difficult way; if he cannot picture these deformations after he has made the analysis, he does not know what he is talking about.

- Hardy Cross and N.D. Morgan,
Continuous Frames of Reinforced Concrete,
Wiley, New York, 1932

Central Mining Research Institute, Nagpur and Wavelet Group, Pune Jointly Develop Fragment Analysis: *FRAGALYST*

Fragalyst is a MS-Windows based fragment image analysis software package for use on Personal Computers. This pioneering software product is the outcome of joint research and development between Central Mining Research Institute, Nagpur and Wavelet Group, Pune, India. *Fragalyst* accepts a digitized image (colour or black and white) of a pile of fragments and performs computer analysis of the image for obtaining vital size and shape related information of visible fragments in the image. The package offers user-friendly menus for performing geometric analysis of large number of fragments in the image of pile of fragments.

Fragalyst offers variety of features which help in visualizing scientific, statsistical and geometric analysis of an image. The features include blob analysis, enhancement, mensuration, pre and post processing which enable the user to precisely assess the fragments of widely varying sizes and measure and compare their width, length, area, perimeter, shape and spherocity graphically as well as statistically. The drop down menus and on line help with a mosaic screen make it versatile yet very simple so that even a computer beginner can use it effectively.

Fragalist works with a PC having minimum configuration as Pentium @ 100 Mhz, 1 GB HDD, 16 MB RAM, colour monitor, 1.44 MB FDD and a suitable Windows 3.11 or 95 environment. It offers TWAIN compatibility with most professional image acquistion cards. Images may be picture photogrpahs captured from still cameras or video films acequired from video cameras.

-CMRI Dhanbad & Wavelet Group, Pune, India.

Scientific Medicine - Success or Failure?

One of the simplest and best definitions of science is John Ziman's term 'reliable knowledge'. Medicine is a science with a purpose, the imporvement of patient care. When reliable knowledge has been used to improve patient care, the record shows that scientific medicine has been a resounding success. But recently we have failed to keep firmly in view the true aim of medicine. Medicine has acquired the attitudes of pure science where things are done with no clear practical end in terms of benefit to the patient. It is the damaging proliferation of technologies which have no proven values in terms of cure, care or comfort which has led to soaring costs without any patient perception of substantially greater clinical success. Unless we rigourously keep in mind the idea that the standards we now apply to new drugs should be applied also to every form of innovation in medical care, we face the spectre of arbitrary and unreasoning political and economic intervention in the medical care system. This will inevitably lead to the frequent simultaneous disposal of babies and bathwater, an end which will serve the interests of neither the patients nor the profession.
(Theory of entropy and experiences suggest that the biochemical medicine is the scientific choice).

Extract from an article by D.F. Horrobin,
Oxford Text book of Medicine,
Vol. 1, 2nd edition 1987.

Vegetarianism, the Economic Facts

Research all over the world has conclusively shown that a well balanced fruit/vegetarian diet is better for health. It is true that it is difficult to expect, or try to make every one a fruitarian/vegetarian, in this varied, multireligious, multi-ethnic country. It is also true that a small proportion of the total population is dependent on the meat industry. But let us not be under any illusion that meat-eaters are doing the country a favour. They may be, to a considerable extent, indirectly responsible for the high prices of food grains, vegetables and fruits and even milk as valuable fodder which could be given to milch cows is fed to goats instead.

They may also be partly responsible for the degradation of 60 million hectares of land, of deep erosion in the Himalayas, silting up of reservoirs, and the contamination of rivers and of lakhs of hectares of ground water reserves by tanneries.

- Extract from an Article by Prof. A. Sridharan
Deputy Director, Indian Institute of Science, Bangalore, India.
The Hindu, Oct., 1996

Gayatri Mantra

The Gayatri Mantra, chanted for centuries by sages and householders, is believed to have produced magical results. Ailments have been cured, the mind has been healed, signs of aging have been reversed, negative circles and patterns have been banished. Protective wave encircle the chanter. In experiments at Stanford University, USA, plants have responded to this mantra under laboratory test conditions.

- The Hindustan Times,
June 14, 1997

The road to happiness is always under construction.

**

Earthquake, boiling of milk and falling in love are random phenomenae and do not follow any law.

- Anonymous

BUREAU OF INDIAN STANDARD CODES ON ROCK MECHANICS AND TUNNELLING TECHNOLOGY

CIVIL ENGINEERING DIVISION (CED)

"STANDARDIZATION IN THE FIELD OF CIVIL ENGINEERING, INCLUDING STRUCTURAL ENGINEERING, BUILDING MATERIALS AND COMPONENTS; PLANNING, DESIGN, CONSTRUCTION AND MAINTENANCE OF CIVIL ENGINEERING STRUCTURES; CONSTRUCTION PRACTICES; SAFETY IN BUILDINGS; BUT EXCLUDING THOSE SUBJECTS WHICH SPECIFICALLY RELATE TO RIVER VALLEY PROJECTS"

CED 2 - CEMENT AND CONCRETE

SCOPE :- STANDARIZATION IN THE FIELD OF ALL TYPES CEMENT, POZZOLANA, TESTING OF SAND, CONCRETE, AGGREGATS, INSTRUMENTS FOR CEMENT AND CONCRETE TESTING, CEMENT PLANT, MACHINERY AND FERROCEMENT.

STANDARDS PUBLISHED :

IS : 2386 (PT 8) : 1963 Method of test for aggregates for concrete: part 8 petrographic examination.

CED 39 - EARTHQUAKE ENGINEERING

SCOPE:- STANDARDIZATION IN THE FIELD OF DESIGN AND CONSTRUCTION OF EARTHQUAKE RESISTANT STRUCTURES AND IN THE FIELD OF MEASUREMENTS AND TESTS CONNECTED THEREWITH

STANDARDS PUBLISHED:

IS : 4967 - 1968 Recommendations for seismic instrumentation for river valley projects
IS:6922- 1973 Criteria for safety and design of structures subject to underground blasts

CED 41 - WATERPROOFING AND DAMP-PROOFING

SCOPE:- STANDARDIZATION IN THE FIELD OF WATERPROOFING AND DAMP-PROOFING MAINLY WITH REFERENCE TO GENERAL BUILDING CONSTRUCTION INCLUDING SPECIFICATION FOR MATERIALS, CODE OF PRACTICE AND METHODS OF TESTS

STANDARDS PUBLISHED:

IS:6494-1988* Code of practice for water proofing of underground water reservoirs and swimming pools (first revision)

DRAFT STANDARDS APPROVED FOR WIDE CIRCULATION:

DOC:CED 41(5121) Code of practice for water proofing of basement and underground structure (revision of IS 6494)

CED 43 - FOUNDATION ENGINEERING

SCOPE:- STANDARDIZATION IN THE FIELD OF FOUNDATION ENGINEERING INCLUDING IN PARTICULAR, DESIGN REQUIREMENTS AND CONSTRUCTION PRACTICES FOR VARIOUS TYPES OF FOUNDATIONS AND SPECIAL LOAD TESTS ON FOUNDATIONS, EXCLUDING SUCH BASIC AND GENERAL ASPECTS DEALING WITH SOIL ENGINEERING COVERED BY SOILS AND SOIL ENGINEERING

STANDARDS PUBLISHED:

IS:10270-1982 Guidelines for design and construction of prestressed rock anchors

CED 44 - METHODS OF MEASUREMENT OF WORKS OF CIVIL ENGINEERING (EXCLUDING RIVER VALLEY PROJECTS)

SCOPE:- STANDARDIZATION IN THE FIELD OF MEASUREMENT OF CIVIL ENGINEERING WORKS EXCLUDING THOSE RELATING TO RIVER VALLEY PROJECTS

STANDARDS PUBLISHED:

IS:1200(Part 25)-1971 Method of measurement of building **and civil engineering works: Part 25 Tunnelling (second revision).**
IS:1200(Part 26)-1987 Method of measurement of building and civil engineering works: Part 26 Acid resistant lining.

CED 45 - SAFETY IN CONSTRUCTION

SCOPE:- FORMULATION OF STANDARDS LAYING DOWN SAFETY REQUIREMENTS IN THE VARIOUS OPERATIONS INVOLVED IN DIFFERENT TYPES OF CIVIL ENGINEERING CONSTRUCTION

STANDARDS PUBLISHED:

IS:3764-1992 Code of safety for excavation work (first revision)
IS:4081-1986 Safety code for blasting and related drilling operations (first revision)
IS:4756-1978 Safety code for tunnelling work (first revision)

CED 48 - ROCK MECHANICS

SCOPE:- FORMULATION OF INDIAN STANDARDS IN THE FIELD OF ROCK MECHANICS COVERING FIELD AND LABORATORY TESTS, ROCK SAMPLING CLASSIFICATION OF ROCK AND ROCK MASSES FOR ENGINEERING ROCK PURPOSES, LOAD BEARING CAPACITIES OF ROCK MASSES, IMPROVEMENT OF ROCK MASS AND ROCK SLOPES

STANDARDS PUBLISHED:

IS:7317-1993 Code of practice for uniaxial jacking test for deformation modulus of rock
IS:7746-1991 Code of practice for in-situ shear test on rock (first revision)
IS:8764-1978* Method of determination of point load strength index of rocks
IS:8143-1978 Method for the determination of unconfined compressive strength of rock materials
IS:8178-1978 Method for the preparation of rock specimen for laboratory testing
IS:8221-1978 Method for the determination of modulus of elasticity and Poisson's ratio of rock materials in uniaxial compression
IS:10050-1981 Method for determination of slake durability index of rocks
IS:10082-1981 Method of test for the determination of tensile strength by indirect tests on rock specimens
IS:10782-1983 Method for laboratory determination of dynamic modulus of rock core specimens
IS:11309-1985 Method of conducting pull-out tests on anchor bars and rock bolts
IS:11315(Part 1)-1987 Method for the quantitative description of discontinuities in rock mass: Part 1 Orientation
IS:11315(Part 2)-1987 Method for the quantitative description of discontinuities in rock mass: Part 2 Spacing
IS:11315(Part 3)-1987 Method for the quantitative description of discontinuities in rock mass: Part 3 Persistence
IS:11315(Part 4)-1987 Method for the quantitative description of discontinuities in rock mass: Part 4 Roughness
IS:11315(Part 5)-1987 Method for the quantitative description of discontinuities in rock mass: Part 5 Wall strength
IS:11315(Part 6)-1987 Method for the quantitative description of discontinuities in rock mass: Part 6 Aperture
IS:11315(Part 7)-1987 Method for the quantitative description of discontinuities in rock mass: Part 7 Filling
IS:11315(Part 8)-1987 Method for the quantitative description of discontinuities in rock mass: Part 8 Seepage
IS:11315(Part 9)-1987 Method for the quantitative description of discontinuities in rock mass: Part 9 Number of sets
IS:11315(Part 10)-1987 Method for the quantitative description of discontinuities in rock mass: Part 10 Block size
IS:11315(Part 11)-1985 Method for the quantitative description of discontinuities in rock mass: Part 11 Core recovery and rock quality
IS:11315(Part 12)-1992 Method for the quantitative description of discontinuities in rock mass: Part 12 Drillcore study
IS:11358-1987 Glossary of terms and symbols applicable to rock mechanics
IS:12070-1987 Code of practice for design and construction of shallow foundation on rock
IS:12608-1989 Methods of test for hardness of rock
IS:12634-1989 Method of determination for direct shear strength of rock joints
IS:12955(Part 1)-1990 Code of practice for in-situ determination of rock mass deformability using a flexible dilatometer: Part 1 volume change
IS:12955(Part 2)-1990 Code of practice for in-situ determination of rock mass

deformability using a flexible dilatometer: Part 2 radial displacement
IS:13030-1991 Method of test for laboratory determination of water content, porosity, density and related properties of rock material
IS:13047-1991 Method of determination of strength of rock materials in triaxial compression
IS:13063-1991 Code of practice for structural safety of buildings on shallow foundations on rocks
IS:13365(Part 2)-1992 Quantitative classification systems of rock mass - Guidelines: Part 2 Rock mass quality for prediction of support pressure in underground openings
IS:13372(Part 1)-1992 Code of practice for seismic testing of rock mass: Part 1 Within a borehole
IS:13372(Part 2)-1992 Code of practice for seismic testing of rock mass: Part 2 Between the borehole
IS:13414-1992 Guidelines for monitoring of rock movement and multi-point borehole extensometers
IS:13946(Part 1)-1994 Code of practice for in-situ determination of rock stress: Part 1 Using hydraulic fracturing technique
IS:13946(Part 2)-1994 Code of practice for in-situ determination of rock stress: Part 2 Using USBM type drill hole deformation gauge
IS:13946(Part 3)-1994 Code of practice for in-situ determination of rock stress: Part 3 Using a CSIR or CSIRO type cell with 9 or 12 strain gauges
IS:13946(Part 4)-1994 Determination of rock stress - Code of practice: Part 4 Using flat jack technique
IS:14243(Part 1)-1995 Guidelines for selection and development of site for building in hill stress: Part 1 Microzonation of urban centres
IS:14243(Part 2)-1995 Guidelines for selection and development of site for building in hill stress: Part 2 Selection and development
IS:14359- 1996 Guidelines for monitoring of rock movements using probe inclinometer
IS:14395 - 1996 Guidelines for monitoring of rock movements using probe inclinometer
IS:14396(Part 1)-1996 Methods for laboratory testing of agrillaceous swelling rocks: Part 1 Methods of sampling storage and preparation of test specimens
IS:14396(Part 2)-1996 Methods for laboratory testing of agrillaceous swelling rocks: Part 2 Determination of maximum axial swelling stress
IS:14396(Part 3)-1996 Draft Indian Standard on methods for laboratory testing of agrillaceous rocks: Part 3 Determination of axial and radial free swelling strain
IS:14396(Part 4)-1996 Methods for laboratory testing of agrillaceous swelling rock: Part 4 Determining axial swelling stress as a function of axial swelling strain

FINALISED DRAFTS UNDER PRINT:

DOC:CED 48(4107) Qualitative classification system of rock mass - Guidelines : Part 1 RMR for predicting of engineering properties
DOC:CED 48(4858) Guidelines for classification system of rock mass: Part 3 Determination of slope mass rating (SMR)
DOC:CED 48(5189) Code of practice for reinforcement of rock slopes with plane edge failure
DOC:CED 48(5596) Method of test for laboratory determination of resistivity on rock specimen

DOC:CED 48(5464) Code of practice on deep foundation
DOC:CED 48(9001) Revision of IS:8764-1978
DRAFTS COMPLETED FOR WIDE CIRCULATION :
DOC:CED 48(5597) Guidelines for tunnelling methods in rock masses
DOC:CED 48(5605) Code of Practice for use in the prodiction of subsidence and associated parameters in coalmines having nearly horizontal single plain working
DRAFT STANDARDS FORMULATED:
DOC:CED 48(5646) Code of practice on blast vibration monitoring
DRAFT STANDARDS UNDER PREPARATION:
DOC:CED 48(5597) Guidelines for tunnelling methods in rock masses
DOC:CED 48(5005) Code of practice for use in the prediction of subsidence and associated parameters in coal mines having nearly horizontal single seam workings

CED 56 - HILL AREA DEVELOPMENT ENGINEERING

SCOPE :- STANDARDIZATIO IN THE FIELD OF DEVELOPMENT ACTIVITY OF HILL AREAS SUCH AS LANDSLIDE ANALYSIS, SITE EVALUATION FOR HUMAN SETTLEMENT, SAFE DESIGN, SELECTION OF BUILDING MATERIALS AND MODES OF CONSTRUCTION SUITABLE FOR HILL AREAS.

FINALIZED DRAFT UNDER PRINT :

DOC:CED 56(5493) Guidelines for preparation of landslide hazard zonation maps in mountainous terrain : part 2 macro zonation

STANDARDS WITHDRAWN / SUPERSEDED

IS:936-1966 Specification for underground fire hydrant, double valve type
IS:7292-1974 Code of practice for in-situ determination of rock properties by flat jack
IS:10785-1983 Method for determination of compressive and tensile strength for point load tests on rock lumps

HEAVY MECHANICAL ENGINEERING DIVISION (HMD)

"STANDARDIZATION IN THE FIELD OF HEAVY MECHANICAL ENGINEERING DIVISION"

HMD 08 - MINING TECHNIQUES AND EQUIPMENT SECTIONAL COMMITTEE

SCOPE:- A) FORMULATION OF INDIAN STANDARDS RELATING TO BASIC MINING TECHNIQUES AND EQUIPMENT,
B) COORDINATION OF WORK WITH ISO/ TC 32 MINING

STANDARDS PUBLISHED:
IS:4791-1968 Glossary of mining terms (drainage)**
IS:4792-1968 Glossary of mining terms (ventilation)**
IS:4863-1968 Glossary of mining terms (drilling and blasting)**

IS:5028-1969 Glossary of mining terms (planning and surveying)**
IS:5307-1969 Glossary of mining terms (boring and exploration)**
IS:5767-1970 Glossary of mining terms (strata control)**
IS:5768-1970 Glossary of mining terms (winning and working)**
IS:5814-1970 Glossary of mining terms (shaft and associated equipment)**
IS:5940-1970 Glossary of mining terms (geology)**
IS:7580-1975 Glossary of mining terms (transport)
IS:7974(Part 1)-1976| ISO:710-1-1974 Graphical symbols for use on detailed maps, plans and geological cross sections: Part 1 General rules of representation
IS:7974(Part 2)-1977| ISO:710-2-1974 Graphical symbols for use on detailed maps, plans and geological cross sections: Part 2 Representation of sedimentary rocks
IS:7974(Part 3)-1976| ISO:710-3-1974 Graphical symbols for use on detailed maps, plans and geological cross sections: Part 3 Representation of magnetic rocks
IS:8166-1988| ISO:1717-1974 Rotary drill bits for drilling principally in coal
IS:8266-1976 Expansion shell type roof bolts
IS:13219-1992 Rock bolts for mines (cement grouted) - General requirements
IS:13230-1992 Graphical symbols for use on mine plans
IS:13517-1992 Rock bolts - Resin type - Specification

DRAFTS COMPLETED FOR WIDE CIRCULATION:
DOC:HMD 8(59) Recoverable type roof bolts

DRAFT STANDARDS FORMULATED:
DOC: HMD 8(384) Underground coal mining subsidence - Prediction and management

HMD 21 - DIAMOND CORE AND WATERWELL DRILLING SECTIONAL COMMITTEE

SCOPE:- A) FORMULATION OF STANDARDS FOR DIAMOND CORE DRILLING EQUIPMENT AND WATERWELL DRILLING RIGS INCLUDING THEIR ACCESSORIES. IT ALSO INCLUDES CODES OF PRACTICE FOR DRILLING AND BORING OPERATIONS, B) COORDINATION OF WORK WITH ISO/ TC 82 MINING THROUGH, ISO/TC 82/SC 5 - ROCK DRILLING AND SC 6 DIAMOND CORE DRILLING EQUIPMENT

STANDARDS PUBLISHED:
IS:7156-1974 General requirements for reverse circulation drilling rigs
IS:7206(Part 1)-1986 General requirements for direct circulation rotary drilling rigs: Part 1 With rotary table (first revision)
IS:7209-1974| ISO:722 General requirements for blast hole drilling rigs
IS:10208-1982| ISO:3555 Diamond core drilling equipment
IS:11672-1986 Tungsten carbide buttons and inserts for use in down-the hole (DTH) bits
IS:11710-1986 Code of practice for selection and design of diamond core drill**
DRAFTS COMPLETED WIDE CIRCULATION:
DOC:HMD 21(126) Water swivel for use with diamond core drilling - Specification

DOC:HMD 21(127) Hoist swivel for use with diamond core drilling - Specification

DRAFTS STANDARDS APPROVED FOR WIDE CIRCULATION:
DOC:HMD 21(277) Water well drilling and blast hole drilling-rock roller bit with non sealed ball and roller bearing arrangement - Technical supply conditions (revision of IS:12635-1989)

RIVER VALLEY DIVISION (RVD)

"STANDARDIZATION IN THE FIELD OF RIVER VALLEY DEVELOPMENT"

RVD 2 - TERMINOLOGY RELATING TO RIVER VALLEY PROJECTS

SCOPE:- STANDARDIZATION FOR TERMS AND SYMBOLS USED IN MULTI-PURPOSE RIVER VALLEY PROJECTS

STANDARDS PUBLISHED:
IS:4410(Part 7)-1982 Glossary of terms relating to river valley projects: Part 7 Engineering geology (first revision)
IS:4410(Part 10)-1988 Glossary of terms relating to river valley projects: Part 10 Hydroelectric power station including water conductor system (first revision)
IS:4410(Part 12)-1993 Glossary of terms relating to river valley projects: Part 12 Diversion works
IS:4410(Part 13)-1985 Glossary of terms relating to river valley projects: Part 13 Operation, maintenance and repairs of river valley projects
IS:4410(Part 19)-1996 Glossary of terms relating to river valley projects: Part 19 Grouting
IS:4410(Part 20)-1983 Glossary of terms relating to river valley projects: Part 20 Tunnels

RVD 5 - GEOLOGICAL INVESTIGATION AND SUBSURFACE EXPLORATION

SCOPE:- CRITERIA FOR CHOICE OF METHODS, INVESTIGATIONS AND TESTING OF SUBSURFACE STRATA AND RECOMMENDATIONS FOR COLLECTION AND PRESENTATION OF DATA

STANDARDS PUBLISHED:
IS:4078-1980 Code of practice for indexing and storage of drill cores (first revision)
IS:4453-1980 Code of practice for exploration by pits, trenches, drifts and shafts (first revision)
IS:4464-1985 Code of practice for presentation of drilling information and core description in foundation investigation (first revision)
IS:5313-1980 Guide for core drilling observations (first revision)
IS:5497-1983 Guide for topographical surveys for river valley projects (first revision)
IS:5529(Part 1)-1985 Code of practice for in-situ permeability test: Part 1 Test in overburden (first revision)
IS:5529(Part 2)-1985* Code of practice for in-situ permeability test: Part 2 Test in bedrock (first revision)

IS:6065(Part 1)-1985 Recommendations for the preparation of geological and geotechnical maps for river valley project: Part 1 Scales (first revision)
IS:6926-1996 Diamond core drilling for site investigation for river valley projects - Code of practice (first revision)
IS:6935-1973 Method for determination of water level in a bore hole
IS:6955-1973 Code of practice for subsurface exploration for earth and rockfill dams
IS:7422(Part 1)-1974 Symbols and abbreviations for use in geological maps, sections and subsurface exploratory logs: Part 1 Abbreviations
IS:7422(Part 2)-1974 Symbols and abbreviations for use in geological maps, sections and subsurface exploratory logs: Part 2 Igneous rocks
IS:7422(Part 3)-1974 Symbols and abbreviations for use in geological maps, sections and subsurface exploratory logs: Part 3 Sedimentary rocks
IS:7422(Part 4)-1985 Symbols and abbreviations for use in geological maps, sections and subsurface exploratory logs: Part 4 Metamorphic rocks
IS:7422(Part 5)-1992 Symbols and abbreviations for use in geological maps, sections and subsurface exploratory logs: Part 5 Line symbols for formation contacts and structural features
IS:10060-1981 Code of practice for subsurface investigation for power house sites
eIS:10290-1982 Code of practice for photogeological interpretation and mapping of river valley site
IS:11385-1985 Code of practice for subsurface exploration for canals and cross drainage works
IS:13216-1991 Code of practice for geological exploration for reservoir sites
IS:13578-1992 Subsurface exploration for barrages and weirs - Code of practice
IS:14330-1995 Groundwater investigations for hydraulic structures - Guidelines

DRAFT STANDARDS ISSUED IN WIDE CIRCULATION:
DOC:RVD 5(142) Recommendations for preparation of geological and geotechnical maps for river valley projects: Part 2 Format and method of presentation of geological and geotechnical maps

RVD 8 - FOUNDATIONS AND SUBSTRUCTURES

SCOPE:- CRITERIA FOR DESIGN AND CONSTRUCTION OF FOUNDATIONS AND SUBSTRUCTURES ON ROCKS, IMPERMEABLE AND PERMEABLE STRATA FOR RIVER VALLEY STRUCTURES INCLUDING METHODS OF FOUNDATION TREATMENT

STANDARDS PUBLISHED:
IS:6066-1994 Recommendations for pressure grouting of rock foundations in river valley projects (second revision)
IS:11293(Part 1)-1985 Guidelines for the design of grout curtains: Part 1 Earth and rockfill dams
IS:11293(Part 2)-1993 Guidelines for the design of grout curtains: Part 2 Masonry and concrete dams
IS:11973-1986 Code of practice for treatment of rock foundations, core and abutment, contacts with rock for embankment dams
IS:12584-1989 Specification for bentonite for grouting in civil engineering works

RVD 9 - DAMS (OVERFLOW AND NON-OVERFLOW) AND DIVERSION WORKS

SCOPE:- CRITERIA FOR SELECTION, DESIGN, CONSTURCTION AND MAINTENANCE, AND SAFETY FOR VARIOUS TYPES OF DAMS AND DIVERSION WORKS WITH DIFFERENT MATERIALS OF CONSTRUCTION TOGETHER WITH THE REQUIREMENTS FOR THEIR MODEL TESTING AS APPLICABLE

STANDARDS PUBLISHED:

IS:9461-1980 Guidelines for data required for design of temporary river diversion works
IS:9795(Part 1)-1981 Guidelines for the choice of the type of diversion works: Part 1 Coffer dams
IS:10084(Part 1)-1982 Criteria for design of diversion works: Part 1 Coffer dams
IS:10084(Part 2)-1994 Design of diversion works - Criteria: Part 2 Diversion channels and open cut or conduit in the body of dam
IS:10135-1985 Code of practice for drainage system for gravity dams, their foundations and abutments (first revision)

DRAFT STANDARDS ISSUED IN WIDE CIRCULATION:

DOC:RVD 9(163) Choice of the type of diversion works - Guidelines: Part 2 tunnels, channels and open cut or conduit in the body of dam

RVD 14 - WATER CONDUCTOR SYSTEM

SCOPE:- CRITERIA FOR DESIGN, CONSTRUCTION AND MAINTENANCE OF THE COMPONENTS OF WATER CONDUCTOR SYSTEM INCLUDING POWER CHANNELS

STANDARDS PUBLISHED:

IS:4880(Part 1)-1987 Code of practice for design of tunnels conveying water: Part 1 General design (first revision)
IS:4880(Part 2)-1976 Code of practice for design of tunnels conveying water: Part 2 Geometric design (first revision)
IS:4880(Part 3)-1976 Code of practice for design of tunnels conveying water: Part 3 Hydraulic design (first revision)
IS:4880(Part 4)-1971 Code of practice for design of tunnels conveying water: Part 4 Structural design of concrete lining in rock
IS:4880(Part 5)-1972 Code of practice for design of tunnels conveying water: Part 5 Structural design of concrete lining in soft strata and soils
IS:4880(Part 6)-1971 Code of practice for design of tunnels conveying water: Part 6 Tunnel support
IS:4880(Part 7)-1975* Code of practice for design of tunnels conveying water: Part 7 Structural design of steel lining
IS:5330-1984 Criteria for design of anchor blocks for penstocks with expansion joints (first revision)
IS:5878(Part 1)-1971 Code of practice for construction of tunnels conveying water: Part 1 Precision survey and setting out
IS:5878(Part 2, Section 1)-1970 Code of practice for construction of tunnels conveying water: Part 2 Underground excavation in rock, Section 1 Drilling and blasting
IS:5878(Part 2, Section 2)-1971 Code of practice for construction of tunnels conveying water: Part 2 Underground excavation in rock, Section 2 Ventilating, lighting, mucking and dewatering

IS:5878(Part 2, Section 3)-1971 Code of practice for construction of tunnels conveying water: Part 2 Underground excavation in rock, Section 3 Tunnelling method for steeply inclined tunnels, shafts and underground power houses
IS:5878(Part 3)-1972 Code of practice for construction of tunnels conveying water: Part 3 Underground excavation in soft strata
IS:5878(Part 4)-1971 Code of practice for construction of tunnels conveying water: Part 4 Tunnel supports
IS:5878(Part 5)-1976 Code of practice for construction of tunnels conveying water: Part 5 Concrete lining (first revision)
IS:5878(Part 6)-1975 Code of practice for construction of tunnels conveying water: Part 6 Steel lining
eIS:5878(Part 7)-1972 Code of practice for construction of tunnels conveying water: Part 7 Grouting
IS:7357-1974 Code of practice for structural design of surge tanks
IS:7396(Part 1)-1985 Criteria for hydraulic design of surge tanks: Part 1 Simple, restricted orifice and differential surge tanks (first revision)
IS:7396(Part 2)-1985 Criteria for hydraulic design of surge tanks: Part 2 Tail race surge tanks (first revision)
IS:7396(Part 3)-1990 Criteria for hydraulic design of surge tanks: Part 3 Special surge tanks
IS:7396(Part 4)-1983 Criteria for hydraulic design of surge tanks: Part 4 Multiple surge tanks
IS:7563-1985 Code of practice for structural design of cut and cover concrete conduits (first revision)
IS:7916-1992 Code of practice for open power channels (first revision)
IS:11105-1984 Code of practice for design aspect of tunnel plugs
IS:11625-1986 Criteria for hydraulic design of penstocks
IS:11639(Part 1)-1986 Criteria for structural design of penstocks: Part 1 Surface penstocks
IS:11639(Part 2)-1995 Criteria for structural design of penstocks: Part 2 Buried/ embedded penstocks
IS:11639(Part 3)-1996 Criteria for structural design of penstocks: Part 3 Specials for penstocks
IS:12633-1989 Guidelines for first filling and emptying of pressure tunnels
IS:12967(Part 1)-1990 Code of practice for analysis of hydraulic transients in hydroelectric and pumping plants: Part 1 Criteria for analysis

DRAFT STANDARDS ISSUED FOR WIDE CIRCULATION:
DOC:RVD 14(54) Code of practice for design of tunnels conveying water Part 8 Structural design of plain concrete lining for power tunnels
DOC:RVD 14(156) Construction of tunnel plugs - Guidelines

DRAFT STANDARDS APPROVED FOR WIDE CIRCULATION:
DOC:RVD 14(199) Code of practice for design of tunnels conveying water: Part 7 Structural design of steel lining [Revision of IS 4880 (Part7)]

RVD 15 - HYDROELECTRIC POWER HOUSE STRUCTURES

SCOPE:- CRITERIA FOR THE CHOICE OF LOCATION OF POWER HOUSE STRUCTURES OF VARIOUS TYPES, INCLUDING PUMPED STORAGE, THEIR DESIGN, CONSTRUCTION AND MAINTENANCE UNDER VARIOUS CONDITIONS

STANDARDS PUBLISHED:
IS:9120-1979* Guidelines for planning, layout and design of cavities in underground hydroelectric power stations
IS:10024-1984 Code of practice for amenities in power houses
DRAFTS STANDARDS FORMULATED:
DOC:RVD 15(106) Guidelines for planning, layout and design of cavities in underground hydroelectric power stations (first revision of IS:9120-1979)

RVD 19 - COST ANALYSIS AND COST ESTIMATES

SCOPE:- GUIDELINES FOR COST ANALYSIS OF PRINCIPAL ITEMS OF WORK IN A PROJECT TO FACILITATE PREPARATION OF PROJECT ESTIMATE GUIDELINES FOR PREPARATION OF COST ESTIMATES AND CONTROL OF COST DURING CONSTRUCTION

STANDARDS PUBLISHED:
IS:10061-1991 Proforma for analysis of unit rate of excavation of tunnels by cyclic drilling and blasting (first revision)
IS:10062-1991 Proforma for analysis of unit rate of quarrying rock by mechanical means (first revision)
IS:10777-1994 Proforma for analysis of unit rate of rock excavation by mechanical means including blasting for open excavation (first revision)
IS:11399(Part 1)-1985 Guidelines for estimating output norms of items of work in construction of river valley projects: Part 1 Earthwork excavation
IS:11590-1995 Guidelines for working out unit rate cost of the construction equipment used for river valley projects (first revision)
IS:13418-1992 Proforma for analysis of unit rate of grouting
IS:13419-1992 Proforma for analysis of unit rate of shotcreting/ guniting used in river valley projects

DRAFT STANDARDS ISSUED IN WIDE CIRCULATION:
DOC:RVD 19(195) Proforma for analysis of unit rate of dewatering

RVD 21 - SAFETY IN CONSTRUCTION, OPERATION & MAINTENANCE OF RIVER VALLEY PROJECTS

SCOPE:- SAFETY ASPECTS DURING VARIOUS STAGES OF CONSTRUCTION, INSTALLATION, ERECTION OF DIFFERENT COMPONENTS AND APPURTENANCES OF RIVER VALLEY PROJECTS, INCLUDING INSPECTION, OBSERVATION AND MAINTENANCE ASPECTS FROM SAFETY CONSIDERATIONS

STANDARDS PUBLISHED:
IS:10386(Part 1)-1983 Safety code for construction, operation and maintenance of river valley projects: Part 1 General aspects
IS:10386(Part 2)-1982 Safety code for construction, operation and maintenance of river valley projects: Part 2 Amenities, protective clothing and equipment
IS:10386(Part 4)-1992 Safety code for construction, operation and maintenance of river valley projects: Part 4 Handling, transportation and storage of explosives

IS:10386(Part 6)-1983 Safety code for construction, operation and maintenance of river valley projects: Part 6 Construction
IS:10386 (Part 8) - 1995 Safety code for construction, operation and maintenance of river valley projects: Part 8 Excavation

RVD 23 - MEASUREMENT OF WORKS OF RIVER VALLEY PROJECTS

SCOPE:- STANDARDIZATION IN THE FIELD OF MEASUREMENT OF CIVIL ENGINEERING WORKS OF MULTIPURPOSE RIVER VALLEY PROJECTS, COVERING THE METHODS OF MEASUREMENT OF VARIOUS ITEMS OF WORKS

STANDARDS PUBLISHED:
IS:9401(Part 1)-1982 Method of measurement of works in river valley projects (dams and appurtenant structures): Part 1 Excavation for foundation
IS:9401(Part 2)-1982 Method of measurement of works in river valley projects (dams and appurtenant structures): Part 2 Dewatering
IS:9401(Part 3)-1995 Method of measurement of works in river valley projects (dams and appurtenant structures): Part 3 Grouting (first revision)
IS:9401(Part 7)-1984 Method of measurement of works in river valley projects (dams and appurtenant structures): Part 7 Joints
IS:9401(Part 8)-1985 Method of measurement of works in river valley projects (dams and appurtenant structures): Part 8 Instrumentation
IS:9401(Part 9)-1987 Method of measurement of works in river valley projects (dams and appurtenant structures): Part 9 Lining
IS:9401(Part 10)-1990 Method of measurement of works in river valley projects (dams and appurtenant structures): Part 10 Formwork
IS:9401(Part 12)-1992 Method of measurement of works in river valley projects (dams and appurtenant structures): Part 12 Topographical surveys
IS:9401(Part 15, Section 1)-1993 Method of measurement of works in river valley projects (dams and appurtenant structures): Part 15 Investigation works, Section 1 Bore hole drilling
IS:9401(Part 15, Section 2)-1992 Method of measurement of works in river valley projects (dams and appurtenant structures): Part 15 Investigation works, Section 2 Exploratory drifting and logging

DRAFT STANDARDS APPROVED FOR WIDE CIRCULATION:
DOC:RVD 23(126) Method of measurement of works in river valley projects (dams and appurtenant structures): Part 16 Tunnelling

* INDICATES STANDARDS UNDER REVISION
** INDICATES STANDARDS TO BE REVISED
/ INDICATES DUAL NUMBERED STANDARDS
| INDICATES EQUIVALENT STANDARDS

-Compiled by:
Prakash V. Surya,
Research Associate, ISRMTT
Research Project.