GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION No. 2791
TO BE ANSWERED ON WEDNESDAY, DECEMBER 10, 2014

EARTHQUAKE INTENSITY

2791. SHRI RAJU SHETTI:
SHRI CHANDRA PRAKASH JOSHI:

Will the Minister of EARTH SCIENCES be pleased to state:

(a) whether the Government proposes to establish an electronic system to measure intensity of earthquakes;
(b) if so, the details thereof and the manner in which the system is likely to benefit the forecast of earthquakes;
(c) the time by which the system is likely to be established;
(d) whether the Government has issued any guidelines specifically regarding construction of houses in earthquake prone areas; and
(e) if so, the details thereof and if not, the reasons therefor?

ANSWER
MINISTER FOR MINISTRY OF SCIENCE AND TECHNOLOGY AND MINISTRY OF EARTH SCIENCES
(DR. HARSH VARDHAN)

(a) Ministry of Earth System Science- National Centre for Seismology (MoES-NCS) maintains a national seismological network consisting of 42 digital seismograph stations to measure earthquake magnitude and monitor earthquake activity in and around Indian region. Additionally, 78 new digital seismographs are likely to be installed during 2015-16.

(b) The ground motion data recorded by the instrument system are used for the estimation of magnitude and other earthquake parameters. To date, there is no proven scientific technique available anywhere in the world to forecast/predict the occurrence of earthquake with reasonable degree of accuracy with regard to space, time and magnitude.

(c) 42 digital seismograph stations are already in operation and 78 new are likely to be installed during 2015-16.

(d-e) Loss of life and damage to property due to earthquakes could be considerably reduced through proper planning and implementation of pre- and post-disaster preparedness and management strategies by respective State and Central Government agencies in a coordinated manner. Guidelines have also been published by the Bureau of Indian Standards (BIS), Building Materials & Technology Promotion Council (BMTPC) and Housing and Urban Development Corporation (HUDCO) etc. for the design and construction of earthquake resistant structures to minimize the loss of life and damage to property caused by earthquakes (Annexure I). These guidelines are in wide circulation amongst the public and the administrative authorities responsible for the design and construction of earthquake resistant structures in earthquake prone areas.

Ministry of Home Affairs is keen to see at least from now that all new buildings constructed under various National and State schemes should be made earthquake resistant (as per the Bureau of Indian Standards detailed at Annexure-II) in the first instant so that no new additions to the stock of existing unsafe buildings are made.

Annexure-I

Brochures and Guidelines published by Housing and Urban Development Corporation (HUDCO) & Building Materials & Technology Promotion Council (BMTPC) for construction and retrofitting of buildings:

1. **Brochure for mitigating damage to dwellings (in English, Hindi, Tamil, Telugu, Oriya and Bengali by HUDCO).**
2. **Brochures on house construction in Jabalpur and Chamoli earthquake-affected areas (in Hindi, by HUDCO).**
3. **Retrofitting of stone houses in Marathwada area of Maharashtra, (BMTPC), 1994.**
4. **Guidelines for repair, strengthening and reconstruction of houses damaged in the 30 September, 1993 earthquake in Maharashtra (Government of Maharashtra), 1994.**
5. **Earthquake and Building, A guidebook to understand the relationship between the two, (TARU), 1994.**
6. **Build Your Home with Earthquake Protection, (BMTPC), 1995.**
7. **Guidelines 1 – Earthquake-resistant construction of houses in Jabalpur earthquake-affected areas (in Hindi, English, BMTPC), 1997.**
8. **Guidelines 2 – Repair and retrofitting of damaged houses in Jabalpur earthquake-affected areas (in Hindi, English, BMTPC), 1997.**
9. **Guidelines 1 – Visual Damage Identification for Chamoli earthquake-affected areas of Uttar Pradesh (in Hindi, English, BMTPC), 1999.**
10. **Guidelines 2 – Repair and retrofitting of damaged houses in Chamoli earthquake-affected areas of Uttar Pradesh (in Hindi, English, BMTPC), 1999.**
11. **Guidelines 3 – Reconstruction and New Construction of Buildings in Chamoli earthquake-affected areas of Uttar Pradesh (in Hindi, English, BMTPC), 1999.**

Annexure-II

Bureau of Indian Standards (BIS) has published various standards/codes on earthquake engineering. A list of standards is enclosed.

LIST OF RELEVANT INDIAN STANDARDS ON EARTHQUAKE RESISTANT DESIGN AND CONSTRUCTION

S.No.	IS No.	Title
*1	IS 1893: 1984	Criteria for earthquake resistant design of Structures
2	IS 1893(Part 1): 2002	Criteria for earthquake resistant design of structures: Part 1 General Provisions and buildings.
*3	IS 1893(Part 4) : 2005	Criteria for earthquake resistant design of Structures.:Part 4 Industrial structures including stack like structures.
*4	IS 436:1993	Code of practice for earthquake resistant design and construction of buildings
5	IS 4991:1968	Criteria for blast resistant design of structures for explosions above ground
6	IS 6922:1973	Criteria for safety and design of structures subject to underground blasts
7	IS 13827: 1993	Improving earthquake resistance of earthen building – Guidelines
8	IS 13828:1993	Improving earthquake resistance of low strength masonry building – Guidelines
9	IS 13920:1993	Ductile detailing of reinforced concrete structures subjected to seismic forces- code of practice.
10	IS 13935: 2009	Seismic evaluation repair and strengthening of masonry buildings – Guidelines

*** Under Revision**

FINALISED DRAFTS UNDER PRINT

S.No.	DOC Number	Title
1	DOC.CED 39 (7231)	Criteria for Earthquake Resistant Design of Structures; Part Liquid Retaining Tanks
2	DOC.CED 39 (7620)	Seismic Evaluation and Strengthening of Exiting Reinforced Concrete Building - Guidelines.
3	DOC.CED 39 (7620)	Earthquake Resistant Design and Construction of Building – Code of Practice (Third revision of IS 4326)
4	DOC.CED 39 (7739)	Draft Indian Standards criteria for Earthquake Resistant Design of Structures: Part 3 Bridges and Retaining Walls.