Informatics

WATER SCARCITY – THE CONCERN OF THE HOUR

The dawn of 21st century is a gloomy picture for the future generations of India because of increasing water scarcity, which often fabricating threats of water conflicts. Conflicts. Water is a critically shared resource and its flow is not restricted to any political boundary. India, which relished its past fame as water prosperous country, today is moving towards becoming water stressed nation due to rapid population growth and unequal distribution. In the present scenario, water is seen as a catalyst for war and peace both within the country as well as with the neighbours and hence, cannot be overlooked. The present water scenario highlights scarcity pointing towards the 'conflict'.

As commonly accepted water conflicts are caused due to the lack of availability of fresh water, which is primarily determined by the hydrological cycle as the sea water is yet not successfully desalinized on large scale (NEDECO, 1999.)

The water conflicts, as history suggests, have never been violent (World, 1999). The war over water is neither strategically rationale, nor hydrographically effective or economically viable. Despite all such rational statements, water conflicts do occur. The glaring examples, in our country, are water distribution disputes between Tamilnadu – Karnataka – Andhra Pradesh Punjab and Haryana. The 'Quantitative' water conflicts are more difficult to resolve than the 'Quantitative' ones. The quantity and quality issue of water lead to the debate 'whether water should be considered as a human right or as an economic goods' According to the universal declaration of human rights, Article 25, water is a "collective property, things differ with increasing demand for water. Some have considered pricing the resource as an 'economic goods'. In India, water is not just fundamental to life, but has an added parameter of 'development'. India has recently been labelled as 'water scarce'. A transformation from water prosperous to a scarce country, which exposes a high level of exploitation of water resources in the name of development. Two primary reasons, which immediately attract attention, are :

(i) Unequal distribution of water resources,

(ii) Rapidly increasing population

(i) Unequal distribution of water resources : A careful look at the 50 years growth period since independence, reveal that, the annual per capita availability of water,

in India, has steadily dwindled from 6, 008 m3 in 1947 to 2,266 m3 in 1997 (TERI, 1999). How ever, in 2001, it further dipped to 1,820 m3 and its decline continues with each passing year. In terms of the annual usable water resource, the country has 1,086 km3, out of which, surface and ground water accounts for 690 km3 and 396 km3 respectively. However, the striking feature is that 71% of the usable water serves just 36 % of the geographical area, which is concentrated in the Ganges – Brahmaputra – Meghna basin and Wester Ghats while only 29% of the available water satisfies the needs of 64 % of the country's geographical area (NCIWRDP-99). This has divided the country with massive areas of droughts and floods. The drought conditions due to climate changes worsen situations of water scarcity in India. Drought occurs in over 80% of the country's land area when rains are 25% of the national annual average 554 mm. (IWR, 1996).

(ii) Rapid population growth : India's population has crossed one billion mark (1.027 X 10 9) out of 6.5 X 10 9 world population (Government of India, 2001). India is host to 16% of the world population but commands control over only 2.5 % world's resources and 4 % of the water resources (lyer, 2003). IN fact, inequitable access to supplies, which has increased due to population growth, is one of the important reasons of scarcity. India, being an agrarian economy, has higher demand for agricultural water, followed by an increasing demand from industry and rapid urbanization. If this situation continues, India will become a 'water – scarce' region by the year 2050. Thus, in the coming years, we will have to prepare ourselves to face an acute problem of water scarcity, deteriorating water quality and rapidly multiplying population, 'How are we going to tackle this problem?', is the question every one of us has to think about.

A FEW EXPERIENCES AND OBSERVATIONS IN RESPECT OF M S PIPELINES

I. Waterless Testing of Welded Joints in the Field :

1. Nowadays use of steel pipes with welded joints is increasing. These are generally used for large diameter sizes. When completed lines are to be tested hydraulically in the field for which huge quantity of water is required. In arid and water – scarce regions this is almost impossible. Even if a resourceful contractor tries to bring water by auto – tankers from distant places, such an operation creates an adverse effect on the human population in the area who are not able to get even their minimum daily need of potable water. It is therefore necessary to resort to some method of 'waterless testing'. Without doubt it is to be ensured that the quality of the work is in no way compromised.

2. Normally all the pipes brought to site are tested at works and found acceptable. The field test is only for check the joints that are made in the field. For 'waterless'

testing of joints in the field, the method described below is suitable where huge quantities of water is not locally available.

3. One of the two ends of the steel pipe is swaged in the factory in such a way that the plain end of the other pipe can be inserted in it. The edge outside is welded by standard welding procedure. The inside-edge is also welded from inside the pipeline. The welder is required to enter the pipe from the open end for welding from inside. It is therefore necessary that the size of the pipeline is adequate. The swaged end is fitted with a nipple similar to the once on a bicycle tube. After the welding of both the ends from inside and outside is completed, air is injected through the welding of both the ends from inside and outside is completed, air is injected through the nipple in the very little space between the welded joints by means of a bicycle pump fitted with a pressure gauge and non-return device. If the pressure remains constant without any drop, the joint is considered satisfactory. If the gauge Shows fall in pressure, it suggests that the welding is defective from where air is leaking. To locate the leak, soap solution is applied over the weld. Bubbles on the surface will indicate the location of the leak that will be suitably marked. The leaks are repaired and the joint will be tested again.

4. There are a few limitations of this method as under :

   a. This method can be adopted only where the pipe size will permit welding from inside.

   b. There will be two welding joints instead of one as in case of butt welding. Of course the welding run from inside of pipe wherever specified will not be required.

   c. Testing of each joint will have to be done before next be able to carry out work at a place two-pipes – deep inside the pipeline.

   d. All precautions for the safety of the welder working inside the pipe will have to be taken and adequate lighting inside will have to be provide.

But there is no doubt that this method will prove to be of great help where there is shortage of water. Many a times the pipelines have to be commissioned without testing and it is put only to ‘working test’. Contractors will not be able to evade testing under the pretext that the is no water for testing. They will not be able to do the next joint unless the previous one is tested for the reason stated at ‘c’ above. As such full testing of each joint will be ensured.

5. A sketch to illustrate the arrangement for testing is given for clarity

II Expansion – Contraction of Steel Pipeline :

1. In Western Australia, steel pipelines are laid over ground on concrete pedestals by the side of roads. This may be possible due to sparse population. Such pipelines run for hundreds of kilometres to serve interior areas. In tropical climate where ambient temperatures vary greatly, for steel pipelines laid over ground, the question of expansion – contraction of the pipeline has to be addressed seriously. If not taken care of suitably, excessive expansion will cause the pipeline to lift off or become skewed in alignment to accommodate extra length. Generally there is a practice of providing expansion joints that normally leak and need frequent maintenance. After having very long experience and experimenting, in Western Australia they are using 'balanced expansion-contraction' method and have done away with the expansion joints. In this method, pipelines are laid as usual but a gap is left after a specific length. Mean temperature in the area is ascertained from records and a piece of steel pipe is welded at site at a time when the ambient temperature is near about mean value in a 24 hour cycle. Thus the quantum of contraction at the time of minimum temperature. The resultant expansion and contraction are minimum reducing the respective stresses also to the minimum. CC saddles provide some grip to the pipe and will resist the stresses to some extent. This system has been functioning satisfactorily there since long.