

## Why the CTBT Remains an Elusive Goal

RAKESH SOOD

**ABSTRACT** The last multilateral negotiations in the field of nuclear disarmament took place more than 20 years ago, resulting in the long awaited Comprehensive Test Ban Treaty (CTBT). The treaty, however, has yet to enter into force. India is often held responsible for such uncertainty, in spite of having withdrawn from the negotiations before it was even concluded; at other times, it is the US which is blamed for failing to ratify the CTBT—giving reason to many other countries including China, Israel, Egypt and Iran to withhold their own ratification. This paper argues that the reason for the CTBT's elusiveness is that during negotiations, some key states sought to convert the treaty into more of an instrument of non-proliferation, rather than a first step towards ending the nuclear arms race. In the process, international legal norms were violated. This holds important lessons for the future of arms control and disarmament negotiations.

### INTRODUCTION

More than 20 years after the United Nations opened the Comprehensive Test Ban Treaty (CTBT) for signature on 24 September 1996, it has still not entered into force. It is the only multilateral treaty to have met such an uncertain fate. The call for a CTBT was made long ago, in the early 1950s, as a first step towards nuclear disarmament. The US supported the negotiations when these finally began in 1994, and then President Bill Clinton was the treaty's first signatory; today, there are 183 countries that have signed up<sup>1</sup> and of these, 164 have ratified the treaty. Yet the CTBT's

entry into force remains an elusive goal. Why has the international community failed to see it through? The reason lies in the history and mechanics of the negotiations of the CTBT between 1995 and 1996, and the brazen attempts by some of the key countries to convert what had been a long-sought disarmament objective into a non-proliferation goal. Even today, the proponents of the CTBT are reluctant to face this uncomfortable reality.

Terminology often needs to be seen in its political context. During the 1950s and the early

**Observer Research Foundation** (ORF) is a public policy think-tank that aims to influence the formulation of policies for building a strong and prosperous India. ORF pursues these goals by providing informed and productive inputs, in-depth research, and stimulating discussions. The Foundation is supported in its mission by a cross-section of India's leading public figures, as well as academic and business leaders.



To know more about  
ORF scan this code

1960s, the concepts of 'disarmament' and 'non-proliferation' were both seen as objectives that are not only desirable, but also to be achieved together. A distinction was established between the two with the coming into existence of the Treaty on the Non-Proliferation of Nuclear Weapons (or the Non-Proliferation Treaty, NPT) in 1968. For decades thereafter, 'non-proliferation' became the more urgent and easily achievable objective; and 'disarmament' has proved a more difficult goal, needing stronger political will. Thus, efforts to promote disarmament in tandem were often criticised as diversions from the non-proliferation objective, which became priority.

In September, in an effort to consolidate US President Barack Obama's nuclear legacy, the US introduced, and secured a vote for, a non-binding resolution in the UN Security Council.<sup>2</sup> The exercise was meant to reinforce global support for the CTBT and the work being done by the verification system set up under the International Monitoring System (consisting of a network of seismic monitoring stations, radionuclide laboratories, hydroacoustic and infrasound monitoring networks), strengthen the global norm against nuclear testing, and stigmatise those who violate the norm. It also diverts attention from the fact that President Obama has been unable to overcome opposition to the CTBT in the Republican-dominated Senate. The fact that the US Senate rejected the CTBT in 1999 is the primary reason for other countries, notably China, to withhold their own adherence.

Since the CTBT was opened for signature, only three countries have conducted underground nuclear explosive tests: India and Pakistan tested in May 1998 and have since observed voluntary moratoriums on testing; DPRK (North Korea), for its part, withdrew from the NPT in 2003, and since 2006 has undertaken five nuclear tests, the latest being

on 9 September.<sup>3</sup> The five permanent members of the UN Security Council (US, Russia, UK, France and China, or P5) have continued with their nuclear modernisation programmes without undertaking underground nuclear explosive tests. President Obama has authorised a budget of \$ 1 trillion over the next three decades for maintaining and improving the US' nuclear arsenal under the Stockpile Stewardship Programme.<sup>4</sup> Other countries have similar programmes, though with lesser outlays. These programmes make use of laboratory testing and computer simulations with the results being validated against the accumulated data of earlier tests undertaken by these countries.

## THE QUEST FOR A CTBT

The road to the CTBT has been a long one. The first call for a CTBT was raised by India in 1954. On March 1 of that year, the US carried out a 15-megaton thermonuclear test at Bikini Atoll and there were reports of a radioactive fallout. A Japanese fishing vessel, the Lucky Dragon, was contaminated and its crew suffered radiation sickness, as did the inhabitants of another atoll in the region. Speaking in parliament a month later, on 2 April, then Prime Minister Jawaharlal Nehru expressed concerns over the nuclear arms race between US and USSR symbolised, he said, by the growing number of nuclear tests. He called for a "Stand-Still Agreement on tests" as a first step, pending progress for a more comprehensive solution in respect of prohibition and elimination of nuclear weapons.<sup>5</sup> Some days later, on 8 April, India conveyed a four-point proposal to the UN Secretary General recommending consideration in the Disarmament Commission of a Stand-Still agreement and mobilising world opinion about the destructive effects of nuclear weapons in view of the lack of adequate knowledge on the effects of radioactive fallout.<sup>6</sup> As Nehru's call

received widespread support—including from Pope Pius XII and Albert Einstein—momentum gathered and in 1957, more than 9,000 scientists in 43 countries endorsed the call for a SANE nuclear policy.<sup>7</sup>

The first negotiations on a test ban began the following year among five countries – the US, UK, France, USSR and Canada. The initial Soviet proposal presented in May 1955 made the test ban part of a comprehensive plan to reduce conventional forces and weapons together with the elimination of nuclear weapons. However, the USSR soon delinked the two and made a test ban a stand-alone agreement. The US, UK and France insisted that a test ban be linked to a fissile material cut-off agreement together with safeguards against a surprise attack, either conventional or nuclear. (Note that this was before the age of satellites and other early warning systems.)

Another area of disagreement was verification. The USSR felt that since a test can be detected seismically, it was impossible to aim for a clandestine exercise and thus there was little need for an international verification mechanism. The US, however, felt that the USSR could be capable of hiding a test, given its vast territory. Eventually, the USSR agreed to the establishment of an international supervisory commission, consisting of both land- and sea-based observation posts. Differences, however, persisted over the number of inspections and the sites to be covered by them.

### **LIMITED TEST BAN TREATY<sup>8</sup>**

In 1963, the goal-posts were shifted when then US President John F. Kennedy announced that the US would no longer be the first to conduct tests in the atmosphere. To this announcement, then Soviet Premier Nikita Khrushchev responded with a proposal to ban testing in the

atmosphere, outer space and underwater – since existing verification means were adequate to detect any violation. Within months, the Limited Test Ban Treaty (also known as the PTBT or Partial Test Ban Treaty) was concluded and was entered into force in October 1963. The idea of a test ban was thus reduced to a treaty limited in scope. For the US and USSR, it served to push testing underground, and the arms race continued unabated. France and China declined to sign the treaty and continued with their atmospheric testing till 1974 and 1980, respectively.

Frustrated with the lack of progress on a CTBT during the 1970s and 1980s—Indonesia, Mexico, Peru, Sri Lanka, Venezuela and Yugoslavia—moved a proposal in 1988 to call for a special conference on LTBT state-parties.<sup>9</sup> The objective was to utilise the amendment provisions of the treaty to expand its scope and include underground testing, in keeping with the preambular language of the LTBT which pledged the parties “to seek the discontinuance of all test explosions of nuclear weapons for all time.” The conference was convened in 1991 but ran into an impasse because of strong opposition from the US.<sup>10</sup>

After the PTBT in 1963, the next initiative to restrict testing came in the negotiations leading up to the Nuclear Non-Proliferation Treaty in 1968. The preamble of the NPT recalls the LTBT preambular commitment about seeking the permanent discontinuation of nuclear tests. This is elaborated in Article VI of the NPT which commits the states “to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control.”<sup>11</sup> However, the Article VI commitment remained only on paper. While the US and USSR continued with their respective underground

testing programmes, France and China continued atmospheric testing and also declined to join the NPT; they would eventually join, in 1992.<sup>12</sup>

### **THRESHOLD TEST BAN TREATY**

To address mounting pressure from calls for a test ban, the US and USSR undertook negotiations in early 1974 to consider a ceiling on the yields of nuclear tests. Not long after, both sides came to an understanding about fixing the ceiling between 100 and 200 kilotons. However, setting such a ceiling only served to highlight the need for verification. This required exchanging geological data in the testing areas in order to verify the declared test yields. It also meant that the coordinates of the test locations would need to be shared so that the stated yield could be cross-checked in terms of the geological setting. To permit calibration of seismic instruments by both sides, data of earlier tests and locations also needed to be shared.

By July of 1974, the US and USSR had finalised a Threshold Test Ban Treaty (TTBT)<sup>13</sup> limiting the yield of underground nuclear weapon tests to 150 kt. In the preceding period, both countries had accumulated considerable data on higher yield tests. During the period 1972 to 1976, USSR conducted at least 24 nuclear weapon tests with yields above 150 kt, including some with yields in excess of 1 megaton. In the same period, the US conducted 13 tests above the TTBT cap, including one of 5 megaton. To put this in perspective, the bomb dropped on Hiroshima had an explosive yield of 15 kt, and the Nagasaki bomb of 20 kt.

Parallel negotiations went on between the US and USSR on a Peaceful Nuclear Explosions Treaty (PNET).<sup>14</sup> The NPT (Art V) provided for the benefits of PNEs to be made available to all countries on a non-discriminatory basis. Both the US and USSR had actively pursued a PNE

programme. Under its Operation Plowshare,<sup>15</sup> the US had conducted 27 PNEs for excavating a canal and potential shale oil reserves. The Soviet programme was bigger and had been used for excavations, putting out oil well fires, and deep depth mining. In 1976, the PNET was concluded which provided for grouped explosions with a yield up to 1500 kt, though no individual explosion could be above 150 kt. Explosions at sites other than the declared testing sites (Nevada for the US and Semipalatinsk and Novaya Zemlya for the USSR) were categorised as PNEs. Both sides observed these thresholds though technical details of the verification protocols took much longer and the treaties only entered into force in December 1990. The US declared a moratorium on its PNE programme in 1974 and the USSR followed suit in 1977; by then the USSR had conducted 124 PNEs. Against this backdrop, it is hardly surprising that India described its 1974 test as a PNE.<sup>16</sup>

### **CTBT: MIXED MOTIVATIONS**

With the fall of the Berlin Wall in 1989, the Cold War drew to an end. Two years later, in December 1991, the USSR had broken up. Months earlier, President Mikhail Gorbachev had declared a moratorium on testing. The US Congress reciprocated in 1993, creating the political setting for the beginning of negotiations for a CTBT in 1994. The negotiating mandate adopted by the Conference on Disarmament (CD) in Geneva in January 1994 noted that the treaty should contribute to “the prevention of proliferation in all its aspects and to the process of nuclear disarmament.”<sup>17</sup> A Group of Scientific Experts had been established in 1976 to work on verification requirements though in the absence of actual negotiations, its sessions were not too productive. Yet, it had given a platform to seismologists to exchange baseline data and



undertake informal discussions about the challenges of verification.<sup>18</sup>

An important factor behind the commencement of the CTBT negotiations was also the critical NPT Review Conference scheduled for 1995. Reference has already been made to Article VI of the NPT which was generally expected to kick off with a CTBT. This hope had been repeatedly expressed during the five yearly review conferences of the NPT held in 1975, 1980, 1985 and 1990. Unless extended, the NPT was set to expire in 1995 (Article X of the NPT specified that 25 years after its entry into force, the States Parties would meet to decide about its future and it had entered into force in 1970) and with the end of the Cold War, there was growing pressure from the non-nuclear weapons states for meaningful progress on nuclear disarmament. The commencement of the CTBT negotiations was expected to have a positive influence on the 1995 NPT Review Conference. In fact, the following year the NPT Review Conference called for the conclusion of the CTBT “no later than 1996”, to be followed by negotiations on a Fissile Material Cut-Off Treaty (FMCT), positive and negative security guarantees for the non-nuclear weapon states, and further reductions in nuclear arsenals.

In 1994, the negotiations proceeded on track. Initially, the US was in favour of a limited-duration CTBT but eventually accepted the idea of an indefinite-duration CTBT.<sup>19</sup> However, problems began to surface after the 1995 NPT Review Conference where the non-nuclear weapons states that were seeking to strengthen the disarmament obligations under Article VI, were out-manoeuvred by the five nuclear weapons states and the NPT was extended indefinitely and unconditionally. Shortly thereafter, the US announced a Nuclear Stockpile Stewardship Programme<sup>20</sup> which redefined the CTBT in terms of a zero-yield treaty that would permit maintaining and

improving the nuclear stockpiles without undertaking underground nuclear explosions. It was clear that just as the LTBT had driven nuclear testing underground, the CTBT would only drive testing into the confines of the nuclear laboratories. The five nuclear weapons states had accumulated considerable data from the tests already conducted; in fact, France and China which had also declared a moratorium in the run-up to the NPT Review Conference in 1995 resumed testing thereafter, finally ending their test series in June and July 1996, respectively. By this time, the US had conducted 1054 tests, Russia 715, France 210, and UK and China 45 tests each.<sup>21</sup>

## **VIOLATING DIPLOMATIC NORMS**

India sought to remind the international community that the CTBT needed to be firmly anchored in a nuclear disarmament context and proposed amendments to this effect. However, these were not accepted and on 20 June 1996, India announced that it would not be able to subscribe to the CTBT in its present form. At this point, Article XIV of the draft treaty text provided for the entry into force of the CTBT contingent on the ratification by the 37 countries that were to host facilities for the CTBT's verification system and India was included in this list. After announcing its decision, India withdrew its facilities from the International Monitoring System. This could have been compensated easily by adding some more facilities in other countries in the region.

At this stage, however, the negotiations took a turn unprecedented in international treaty law.<sup>22</sup> Led by a small group of countries including the UK, China and Pakistan, a revised Article XIV was introduced which identified 44 countries by name whose ratification was essential for the CTBT to enter into force. The list included India. This attempt to force India to join a treaty was in violation of India's sovereign

right of voluntary consent to determine its adherence to any international agreement. India had earlier indicated that it would stand aside from the treaty negotiations but now India had no choice but to block consensus in the CD. The CD was therefore unable to present the treaty text to the UN General Assembly.

In a radical departure from past practice and tradition, the UN General Assembly ignored the fact that the CTBT text lacked consensus in the CD and decided to adopt it by simple majority. India voted against the decision in the UN General Assembly, pointing out that it was every country's sovereign right to withhold consent to a treaty and Article XIV that was introduced after India announced its decision, violated not only this principle but also customary international law. India declared that it "will never sign this unequal treaty, not now, nor later. As long this text contains this article, this treaty shall never enter into force."<sup>23</sup>

Some countries that were strong supporters of the CTBT had indicated in their reservations that the new Article XIV would prevent the CTBT's entry into force, but their concerns were not heeded. However, Article XIV also provides for a special conference of States Parties to be held "to decide by consensus what measures consistent with international law may be taken to accelerate the ratification process and to facilitate entry into force."<sup>24</sup> Nine such conferences have been held but apart from the issuance of pious statements, nothing concrete has emerged. The stalemate continues.

## OVERCOMING THE IMPASSE

Out of the 44 countries listed in Article XIV, three countries have not signed the CTBT. In addition to India, these include Pakistan and DPRK. India and Pakistan are observing voluntary moratoriums after having conducted nuclear tests in May 1998. DPRK maintains an

active programme and beginning in 2006, has conducted tests in 2009, 2013 and 2016 (January and September). Since Pakistan has declared that it will not sign unless India does, it is difficult to visualise movement on this front. Equally significant is that there are five countries out of the 44 designated states which have signed but not ratified the CTBT. These are China, Egypt, Iran, Israel and the US. Of these, the US has a difficult ratification procedure. The CTBT had been submitted to Senate for consideration after 1996 but rejected in October 1999 by a narrow margin of 51 against 48. During his term, President George W. Bush did not push this matter and though President Obama vowed in his famous speech in Prague in 2009 to "immediately and aggressively pursue the ratification of the Comprehensive Test ban Treaty,"<sup>25</sup> the Republican-dominated Senate has made it clear that it will not relent. China maintains that it will ratify after the US does so. The other three countries—Egypt, Iran and Israel—are caught up in long-standing regional rivalries which need to be resolved before CTBT ratification even becomes likely. In short, Article XIV, as it currently stands will not permit the CTBT's entry into force in the foreseeable future.


The CTBT has had a long, complex and tortuous past, and it is hardly surprising that it has not entered into force. The goal-posts have been shifted too often and it is not clear what the CTBT is now expected to achieve. When first proposed, it was meant as the necessary first step towards nuclear disarmament; in its present form, it hardly measures up to such an expectation. The negotiating process made it clear that it was getting reduced to a non-proliferation exercise—yet without being acknowledged as such. Perhaps therein lies its infirmity. Nevertheless, it has helped create a norm, but this norm needs to be legalised. For reasons highlighted earlier, the entry into force

seems unlikely under the existing Article XIV because obtaining 44 ratifications from the listed states is highly difficult.

The UN Security Council Resolution 2310,<sup>26</sup> adopted on 23 September 2016 can marginally add to the norm but is not legally binding. Further, the Republicans even voiced opposition to the idea of raising the matter before the UN Security Council. US Senate Foreign Relations Committee Chairman Senator Bob Corker described the CTBT as “an affront to Congress and the American people” because “it would give Russia and China control over our decision if we wanted to test.” The latter is an extreme exaggeration because the resolution is not legally binding but certainly reflective of the Republican sentiment against the CTBT.

Currently, the Preparatory Commission of the CTBT in Vienna hosts an International Monitoring System. The most important segment is the network of 50 primary and 120 auxiliary seismic monitoring stations, spread over 76 countries. These are supplemented by 80 radionuclide monitoring stations and 16 radionuclide laboratories in 27 countries, 60

infrasound monitoring stations in 35 countries and 11 hydroacoustic monitoring stations, both coastal and underwater, in eight countries.<sup>27</sup> The current budget is a modest \$ 128 million but questions have been raised about it, given the remote prospects for entry into force.

There are a number of countries that remain committed to the CTBT and would like to see it enter into force. For this to happen, the only way through is for the States Parties and the signatories to get together and amend Article XIV. This will be politically difficult because it requires accepting the flaw in the existing Article XIV and also clarifying the limited objectives that the CTBT is intended to achieve. It also means accepting the fact that some countries are likely to remain non-parties to the CTBT, at least in the foreseeable future. Unless the supporters of the CTBT are able to tackle the political challenge, the CTBT will remain an elusive goal, a norm which could over time run the risk of simply eroding. Moreover, the negotiating experience also continues to cast a shadow over the prospects of commencing any other multilateral negotiation in the field of arms control and disarmament. 

#### ABOUT THE AUTHOR

**Rakesh Sood** served various positions in his 38-year-long diplomatic career — as Ambassador to the Conference on Disarmament (2000-2003), to Afghanistan (2005-2008), to Nepal (2008-2011), and to France (2011-2013), and as Prime Minister's Special Envoy for Disarmament and Non-Proliferation (2013-2014).

#### ENDNOTES

1. Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization (<https://www.ctbto.org/>).
2. U.S. Department of State, 'Adoption of UN Security Council Resolution 2310' (<http://www.state.gov/r/pa/prs/ps/2016/09/262343.htm>).
3. Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization, 'History of Nuclear Testing' (<https://www.ctbto.org/nuclear-testing/history-of-nuclear-testing/nuclear-testing-1945-today/>).
4. Arms Control Association, 'U.S. Nuclear Modernization Programs' (<https://www.armscontrol.org/factsheets/USNuclearModernization>).
5. India and Disarmament—An Anthology of Selected Writings and Speeches (1988), Ministry of External Affairs
6. Official Records of the Disarmament Commission, Supplement for April, May and June 1954, DC/44 and Corr1
7. Arms Control Association, 'Nuclear Testing and CTBT Timeline' (<https://www.armscontrol.org/factsheets/Nuclear-Testing-and-Comprehensive-Test-Ban-Treaty-CTBT-Timeline>).

8. U.S. Department of State, 'Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water' (<http://www.state.gov/t/isn/4797.htm>)
9. Official Documents System of the United Nations (<https://documents-dds-ny.un.org/doc/UNDOC/GEN/N88/220/60/IMG/N8822060.pdf?OpenElement>)
10. [https://disarmament-library.un.org/UNODA/Library.nsf/534c532818e440ce8525789a006d94f5/7667e53555440188525788b006ad6ff/\\$FILE/PTBT%20Report.pdf](https://disarmament-library.un.org/UNODA/Library.nsf/534c532818e440ce8525789a006d94f5/7667e53555440188525788b006ad6ff/$FILE/PTBT%20Report.pdf)
11. Treaty on the Non-Proliferation of Nuclear Weapons ([https://unoda-web.s3-accelerate.amazonaws.com/wp-content/uploads/assets/WMD/Nuclear/pdf/NPTEnglish\\_Text.pdf](https://unoda-web.s3-accelerate.amazonaws.com/wp-content/uploads/assets/WMD/Nuclear/pdf/NPTEnglish_Text.pdf)).
12. United Nations Office for Disarmament Affairs (<http://disarmament.un.org/treaties/t/npt>).
13. U.S. Department of State, 'Treaty Between The United States of America and The Union of Soviet Socialist Republics on the Limitation of Underground Nuclear Weapon Tests (and Protocol Thereto) (TTBT)' (<http://www.state.gov/t/isn/5204.htm>).
14. U.S. Department of State, 'PNE Treaty' (<http://www.state.gov/t/isn/5182.htm>).
15. U.S. Department of Energy, Office of Scientific and Technical Information (<https://www.osti.gov/opennet/reports/plowshar.pdf>).
16. Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization, 'Peaceful Nuclear Explosions' (<https://www.ctbto.org/nuclear-testing/history-of-nuclear-testing/peaceful-nuclear-explosions/>)
17. United Nations Institute for Disarmament Research (<http://www.unidir.org/files/publications/pdfs/unfinished-business-the-negotiation-of-the-ctbt-and-the-end-of-nuclear-testing-346.pdf>)
18. Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization, '1993-1996: Treaty Negotiations' (<https://www.ctbto.org/the-treaty/1993-1996-treaty-negotiations/1993-95-prelude-and-formal-negotiations/>).
19. Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization, '1993-1996: Treaty Negotiations' (<https://www.ctbto.org/the-treaty/1993-1996-treaty-negotiations/1994-96-debating-the-basic-issues/>)
20. National Nuclear Security Administration (<https://nnsa.energy.gov/ourmission/maintainingthestockpile>).
21. Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization, 'Nuclear Testing' (<https://www.ctbto.org/nuclear-testing/>).
22. United Nations Official Website, Treaties. (<https://treaties.un.org/doc/publication/unts/volume%201155/volume-1155-i-18232-english.pdf>)
23. United Nations Institute for Disarmament Research (<http://www.unidir.org/files/publications/pdfs/unfinished-business-the-negotiation-of-the-ctbt-and-the-end-of-nuclear-testing-346.pdf>)
24. Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization [https://www.ctbto.org/fileadmin/content/treaty/treaty\\_text.pdf](https://www.ctbto.org/fileadmin/content/treaty/treaty_text.pdf)
25. Office of the Press Secretary, The White House (<https://www.whitehouse.gov/the-press-office/remarks-president-barack-obama-prague-delivered>).
26. United Nations Official Website, 'UN Security Council Resolution 2310' ([http://www.un.org/en/ga/search/view\\_doc.asp?symbol=S/RES/2310\(2016\)](http://www.un.org/en/ga/search/view_doc.asp?symbol=S/RES/2310(2016)))
27. Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization <https://www.ctbto.org/verification-regime/background/overview-of-the-verification-regime/>



Ideas • Forums • Leadership • Impact

---

20, Rouse Avenue Institutional Area, New Delhi - 110 002, INDIA  
Ph. : +91-11-43520020, 30220020. Fax : +91-11-43520003, 23210773.  
E-mail: [contactus@orfonline.org](mailto:contactus@orfonline.org)  
Website: [www.orfonline.org](http://www.orfonline.org)