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Implementing the INF-Treaty

The Elimination and Verification Process

1. The Objectives of the INF Treaty and the Role of Basing Countries

The Treaty of December 8, 1987 between the United States of America and the Union of the Soviet Socialist Republics on the Elimination of their Intermediate-Range and Shorter-Range Missiles (INF Treaty)¹ came into force on June 1, 1988. This Treaty aimed at solving the “missile crisis” in Europe and its set objective was to eliminate a whole class of ground-based, nuclear-capable intermediate-, medium- and shorter-range missiles, launchers and support structures. Three years later, on June 1, 1991, the United States and the Soviet Union had destroyed all such assets in accordance with the Treaty provisions.

The elimination process focused on deployed nuclear capable intermediate-range and medium-range ballistic missiles (IRBM/MRBM) and Cruise Missiles (IRCM) with ranges between 1,000 and 5,500 km. NATO assessed that Soviet MRBM such as the SS-4 (RSD-10) and SS-5 (R-12) with ranges well beyond 1,500 km, and in particular the mobile SS-20 (RD-14) IRBM with a range of approximately 5,000 km, were a serious threat to Western Europe. The SS-20 carried three independently targetable re-entry vehicles with nuclear warheads that could reach targets throughout Europe, including the United Kingdom and Spain, and could do so to a high accuracy of an estimated 300 meters. Although these were deployed mainly in Soviet western military districts, the USSR had also based approximately one-third of the more than 1,800 INF systems that it had in service with rocket forces east of the Urals, including 162 SS-20, to threaten China.²

- 1 Treaty between the United States of America and the Union of Soviet Socialist Republics on the Elimination of their Intermediate-Range and Shorter-Range Missiles, December 1987. Selected Documents No. 25, Department of State Publication 9555, published by the U.S. DoS, Bureau of Public Affairs, Office of Public Communication Editorial Division, Washington, D. C., December 1987 (in the following footnotes referred to as “INF Treaty”).
- 2 Steven Pifer, Avis T. Bohlen, William T. Burns, and John Woodworth, The Treaty on Intermediate-Range Nuclear Forces: History and Lessons Learned. Brookings, Arms Control Series Paper 9, December 2012, p. 12; Daryl Kimball and Kingston Reif, The Intermediate-Range Nuclear Forces (INF) Treaty at a Glance. Fact Sheets & Briefs (updated August 2019), p. 2, <https://www.armscontrol.org>.

On the Western side, the U. S. had begun to station ground-launched medium-range ballistic missiles (GLBM) and Cruise Missiles (GLCM) on Allied territories in Western Europe following NATO's Dual-Track Decision of 1979. This deployment included 108 Pershing II GLBM in West Germany and 464 medium range BGM-109G Tomahawk GLCM systems in West Germany, Belgium, the Netherlands, Italy, and the United Kingdom. With ranges from 1,800 to 2,500 km, such mobile systems could reach vital Soviet targets within short flight times. More such systems were held on U. S. territory in a non-deployed state. Despite this, NATO's Dual-Track Decision also kept the door open for dialogue and laid the ground for arms control negotiations aiming at the total elimination of ground-based INF systems.³

In Europe, the large quantity of forward-deployed mobile shorter-range ballistic missiles (SRBM) with ranges between 500 and 1,000 km posed a significant threat to the frontline countries of both alliances. The Pershing IA in West-Germany and the SS-12 (OTR-22) and SS-23 (OTR-23) in the GDR, ČSSR, Hungary, and Bulgaria were prime examples. The latter also posed a risk to NATO's forward-deployed medium-range Cruise and ballistic missiles and, from a Western perspective, had to be included in the INF Treaty. As well as the SRBM held by the Soviet forces stationed in the GDR and ČSSR, Soviet allies like the GDR, ČSSR, Hungary and Bulgaria operated the same types of SRBM. As the West German Pershing IA SRBM, with a range of approximately 780 km, was capable of reaching the Polish–Soviet border area, the Soviet Union wanted a multilateral treaty that would oblige West Germany as well as themselves to scrap such missiles. However, the U. S. insisted on a bilateral agreement in order to keep issues of strategic relevance exclusively under national control.

One argument in favor of a bilateral solution was the fact that, in peacetime, nuclear warheads were held exclusively under the custody of U. S. or Soviet forces and could be released for use through allied delivery only after the President of the United States or the President of the Soviet Union had given authorization. In fact, the INF Treaty did not contain any provisions on counting, verifying or dismantling nuclear warheads other than by separating them from their means of delivery before their destruction.

Eventually, only U. S. and Soviet ground-based intermediate- and shorter-range missiles with ranges from 500 km upwards were covered by the Treaty, together with their launchers and supporting structures. However, this agreement became possible only after Chancellor Helmut Kohl had declared that West

3 Overview in: U. S. Department of State. *Diplomacy in Action*. Bureau of Arms Control, Verification, and Compliance. *Treaty Between The United States of America And The Union of Soviet Socialist Republics On The Elimination Of Their Intermediate-Range And Shorter-Range Missiles (INF Treaty)*, Signed December 8, 1987, <https://2009-2017.state.gov/t/avc/trty/102360.htm#narrative>; see also Bureau of Arms Control, Verification and Compliance, *INF Treaty At a Glance*. Fact Sheet. December 8, 2017; Pifer et al., *The Treaty on Intermediate-Range Nuclear Forces*, pp. 6–13.

Germany would destroy its Pershing IA missiles unilaterally.⁴ National SRBM held by West Germany, the GDR, ČSSR, Hungary, and Bulgaria were destroyed between 1991 and 2002 following unilateral government decisions. The elimination processes of the non-superpowers were not verified under the umbrella of the INF verification regime, or with its methods.

In consequence of the bilateral construction of the INF Treaty, the legal responsibilities for its implementation lay exclusively with the United States and the Soviet Union as the sole state parties to its terms. Nevertheless, as large portions of the INF missiles, launchers and supporting infrastructure were stationed in third countries, the consent of other countries was required for Treaty implementation, in particular for on-site inspections. Therefore, additional multilateral agreements had to be concluded by the United States and the Soviet Union with stationing countries. To that end, the United States concluded “The INF Basing Countries Agreement” in December 1987 with Belgium, the Federal Republic of Germany (FRG), Italy, the Netherlands and the United Kingdom.⁵

2. The INF Elimination and Verification Concept and Practice

To achieve the objective of eliminating all intermediate-, medium- and shorter-range U.S. and Soviet Union missiles globally, it was necessary to make unprecedented and detailed rules for defining, counting and verifying all relevant armaments and equipment. A phased elimination process had to be agreed upon and organized—one that was balanced, transparent and verifiable. Given the numerical superiority of Soviet missiles, what the state parties agreed to was reciprocity of results rather than reciprocity of each and every reduction step. This method ensured that the military balance was maintained at every stage, under intrusive mutual control and observation.

Verification played a crucial role in assuring compliance with a Treaty that had a pivotal impact on security in Europe. The INF concept of verification introduced ground-breaking and unprecedented rules of transparency, including requirements for comprehensive data exchange and on-site inspection. The verification regime had to be construed in line with the scheduled process of the complete elimination of a high number of missiles, launchers, bases, and

4 Paul Nitze, *From Hiroshima to Glasnost*, New York 1989, pp. 421–462; Strobe Talbot, *The Road to Zero*, in: *Time*, December 14, 1987, pp. 18–30. See also the essays by Tim Geiger and Philipp Gassert in this volume.

5 Agreement among the United States of America and the Kingdom of Belgium, the Federal Republic of Germany, the Republic of Italy, the Kingdom of the Netherlands, and the United Kingdom of Great Britain and Northern Ireland Regarding Inspections relating to the Treaty between the United States of America and the Union of Soviet Socialist Republics on the Elimination of their Intermediate-Range and Shorter-Range Missiles, December 1987 (reprint July 1990), United States Information Service, Brussels, Belgium (henceforth “Basing Countries Agreement”).

facilities that the Treaty had banned. These were in various locations throughout Europe and scattered through entire territories of the Soviet Union and the United States. The task required an initial establishment of a reliable database from which to proceed with the withdrawal, separation, and elimination of armaments and equipment subject to the Treaty. On the basis of this, an intrusive and reliable verification regime was designed, capable not only of certifying the completion of the elimination process but also of assuring that every step of the elimination process was done in accordance with the Treaty provisions, and was duly monitored and documented. To that end, the main body of the Treaty's text established the principle provisions while details were specified in additional memoranda and protocols.

The Treaty's main text defined the assets that were to be eliminated, established time lines and basic provisions for the reduction processes, and set forth the verification concept. Details of types of missiles, launchers, and their supporting structures and equipment were contained in a Memorandum of Understanding Regarding the Establishment of the Data Base for the Treaty (MoU).⁶ A Protocol on Procedures Governing the Elimination of the Missile Systems Subject to the Treaty specified procedures for the elimination processes.⁷ Basic provisions for verification were enshrined in the Protocol Regarding Inspections Relating to the Treaty,⁸ which was further complemented in December 1989 by the Memorandum of Agreement⁹ on verification.

2.1 Definitions and Counting Rules

According to Article I of the INF Treaty, both states party to it committed to "eliminate its intermediate-range and shorter-range missiles, not have such systems thereafter, and carry out the other obligations set forth in this Treaty." The state parties also had to eliminate all launchers of such missiles along with all

6 Memorandum of Understanding Regarding the Establishment of the Data Base for the Treaty Between the Union of Soviet Socialist Republics and the United States of America on the Elimination of Their Intermediate-Range and Shorter-Range Missiles (in the following footnotes referred to as "MoU").

7 Protocol on Procedures Governing the Elimination of the Missile Systems Subject to the Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Elimination of Their Intermediate-Range and Shorter-Range Missiles (in the following footnotes referred to as "PoE").

8 Protocol Regarding Inspections Relating to the Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Elimination of Their Intermediate-Range and Shorter-Range Missiles (in the following footnotes referred to as "PoI").

9 Memorandum of Agreement Regarding the Implementation of the Verification Provisions of the Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Elimination of Their Intermediate-Range and Shorter-Range Missiles, Geneva, December 21, 1989 (print July 1990), United States Information Service, Brussels, Belgium.

support structures and equipment.¹⁰ Once the Treaty came into force, the state parties were not allowed to produce, flight-test or launch any intermediate-range missiles (IRM) or shorter-range missiles (SRM) or produce any stages or launchers for such missiles.¹¹

The weaponry subject to the Treaty was confined to ground-launched missiles, with their support structures and equipment, that had range capabilities between 500 and 5,500 km. Those covered included all surface-to-surface missiles but excluded air- and missile defence (surface-to-air) missiles as well as air- and sea-launched Cruise Missiles (ALCM/SLCM).¹² The term “missile” included “ground-launched ballistic missiles” (GLBM) and “ground-launched Cruise Missiles” (GLCM) as weapon-delivery vehicles. “Intermediate-range missiles” (IRM) meant GLBM and GLCM with range capabilities above 1,000 km, reaching up to 5,500 km, while “shorter-range missiles” (SRM) referred to GLBM/GLCM with range capabilities between 500 and 1,000 km. “GLBM/GLCM launchers” were defined as fixed or mobile land-based transporter-erector-launcher mechanisms.¹³

The Treaty differentiated between deployed and non-deployed missiles and launchers according to their operational readiness and the stationing locations. Deployed IRM and IRM-launchers were located within deployment areas which contained one or more missile operating base (MOB) with a complex of support facilities. Deployed SRM and SRM-launchers were located at missile operating bases containing complexes of facilities and support equipment for the operation of SRM.¹⁴

The Treaty defined non-deployed missiles and launchers as those that were located outside deployment areas and MOBs. Such missiles and launchers were not held in a high readiness status for launch and were located in missile support facilities such as those specializing in production, repair, training, storage and elimination, or testing ranges. They could also be in transit—being moved between missile support facilities and deployment areas/MOBs after the transit had been duly notified following the notification provisions.¹⁵

According to article III of the INF Treaty, the following types of missile were subject to its terms: for the U. S.—the BGM-109G GLCM, Pershing II IRBM, and Pershing IA SRBM; for the USSR—the RSD-10 (SS-20), R-12 (SS-4), also the R-14 (SS-5) IRBM and OTR-22 (SS-12) and OTR-23 (SS-23) SRBM. In addition, tested but non-deployed missiles and launchers were subject to the Treaty: for the U. S.—the Pershing I B SR-GLBM; for the Soviet Union—the RK-55 (SSC-X-4) GLCM.¹⁶

10 INF Treaty, Art. IV, V, VI 1.

11 INF Treaty, Art. VI 1.

12 INF Treaty, Art. VII 3, 11.

13 INF Treaty, Art. II 1–6, Art. VII 4.

14 INF Treaty, Art. II 7, 8, 11, 13.

15 INF Treaty, Art. II 9, 10, 12, 14.

16 INF Treaty, Art. X 6.

2.2 Data Exchange and Update Notifications

Details were specified in the Memorandum of Understanding. This contained the data exchanged by both state parties as of November 1, 1987, prior to the signing of the Treaty, a document which established the first baseline data for elimination and verification. These details were updated 30 days after the Treaty came into force. The MoU included 2,619 deployed and non-deployed SRBM, IRBM and IRCM, their launchers, support equipment such as unique missile transporter vehicles, missile erectors, launch stands, propellant tanks as well as the deployment areas, MOBs, and missile support facilities such as production, repair, training, storage, test, and elimination facilities. It also covered missile stages, full-scale inert training missiles, training launch canisters, training launchers, unique fixed support structures for deployed IRBM/IRCM and their launchers as well as research and development launch sites. After data updates, a total of 2,692 INF missiles—1,846 Soviet and 846 U.S. systems—had been destroyed at the end of the elimination process in May 1991, together with their support equipment and structures.¹⁷

The baseline data specified that the U.S. possessed 689 IRM (429 deployed, 260 non-deployed) and 170 non-deployed SRBM; while the Soviet Union possessed 826 IRBM (470 deployed, 356 non-deployed) and 926 SRBM (387 deployed, 539 non-deployed). The aggregate numbers of second stages of U.S. IRBM were 236, and of Soviet IRBM, 650. The aggregate numbers of second stages of U.S. SRBM amounted to 182, while the corresponding number for Soviet SRBM was 726. With the addition of the tested but not deployed 84 Soviet GLCM SSC-X-4, the aggregate number of Soviet missiles subject to the Treaty amounted to 1,836; the aggregate number of U.S. INF missiles was 859.

Furthermore, the MoU specified 292 launchers for U.S. IRM (224 deployed, 68 non-deployed) and one non-deployed launcher for U.S. SRBM. The USSR possessed 608 launchers for IRBM (484 deployed, 124 non-deployed) and 237 launchers for SRBM (197 deployed, 40 non-deployed). It also counted 6 launchers for the tested but not fielded SSC-X-4 GLCM.¹⁸

Soviet missiles, launchers and support structures were dispersed at 133 sites in three states, as shown in Table 1.

U.S. missiles, launchers and support structures were dispersed at 34 sites in six states. All 9 MOBs and three of the 24 supporting facilities were located in Europe, 21 in the United States. This is shown in Table 2.¹⁹

17 FAS Weapons of Mass Destruction, Intermediate-Range Nuclear Forces (INF) <https://fas.org/nuke/control/inf/>.

18 All data referred to here are contained in MoU, Section II—V.

19 Regarding the figure cited for Pershing IIs: most authors refer to 108 P II only, planned to be held in operational readiness on 108 launchers in Germany. The higher number of such missiles indicated in the chart includes those that were kept in reserve in MOBs (12) or as maintenance spares and in a non-deployed status, partially in deployment areas (12), and to

Table 1: Dispersal of Soviet Missiles, Launchers, and Support Structures.

	Soviet Union	GDR	ČSSR	Total
Deployed SS-4/20	470	-	-	470
	61 MOB	-	-	
Deployed SS-12/23	241	107	39	387
	11 MOB	6 MOB	1 MOB	18 MOB
Non-depl. SS-4/5/20	356	-	-	356
	30 facilities	-	-	30 facilities
Non-depl. SS-12/23 and SSC-X-4	539	-	-	539
	24 facilities	-	-	24 facilities

Table 2: Dispersal of U.S. Missiles, Launchers, and Support Structures.

	FRG	UK	Italy	Belg.	Neths.	U. S. A.	Total
Deployed Pershing II	120	-	-	-	-	-	120
	3 MOB						3 MOB
Deployed BGM-109G	62	119	108	20	0	-	309
	1 MOB	2 MOB	1 MOB	1 MOB	1 MOB		6 MOB
Non-depl. Pershing II	12	-	-	-	-	115	127
	2 facil					11 facil	13 facil
Non-depl. BGM-109G	-	-	-	16	-	117	133
				1 facil		6 facil	7 facil
Non-depl, Pershing 1A	-	-	-	-	-	170	170
							4 facil

Belg. = Belgium *Neths.* = Netherlands

Non-depl. = non-deployed *facil* = facilities *MOB* = missile operating base

a larger extent in the United States (115). In 1987, the American figure (exceeding the official 108) caused some concern amongst members of the West German Government, see Akten zur Auswärtigen Politik der Bundesrepublik Deutschland (AAPD) 1987, Munich 1988, Doc. 319, pp. 1610f.

In addition, the MoU specified 11 U. S. and two Soviet Research and Development (R&D) Launch Sites with 30 U. S. and 5 Soviet R&D Booster Systems.²⁰

The data contained in the MoU reflected the situation on November 1, 1987. Details were updated on July 1, 1988, to account for changes that had occurred before the beginning of the scheduled elimination process. After the end of each six-month interval following the moment when the Treaty came into force, each party had to provide a comprehensive new update through its Nuclear Risk Reduction Center (NRRC) to inform about changes in progress or completed removal and elimination processes made during the last half-year.²¹

The scheduled date of elimination of a specific deployment area, MOB or missile support facility, as well as changes to the numbers of items subject to the Treaty at such facilities, had to be notified not later than 30 days in advance. Notifications no later than 30 days in advance were also required for announcing the dates scheduled for the initiation of the elimination of IRM and SRBM, along with stages, launchers and support equipment and structures. The notifications had to include, *inter alia*, the location from which IRM, launchers and support equipment were being moved. For scheduled elimination of launchers of unarmed IRBMs or of research and development boosters a notification no later than 10 days in advance was required.²²

The elimination process progressively changed the numbers of missiles, launchers and support structures, and equipment held by each side, and these changed numbers had to be communicated no later than 48 hours after elimination had occurred. Transits of INF missiles and launchers, including training missiles and training launchers, had to be notified no later than 48 hours after their completion.²³ Further notifications were delivered, as required by the elimination process and its verification, through on-site inspections or cooperative measures by use of National Technical Means (NTM).

2.3 Reduction Phases and Methods of Elimination

The Treaty required each party to have destroyed all deployed and non-deployed IRM and SRBM, launchers, support structures and equipment no later than three years after its entry into force.²⁴ Reductions had to be carried out in defined phases which distinguished between IRM and SRBM. Rather than specify equal numbers of missiles and launchers to be destroyed, the Treaty opted for these phases to ensure a strategic balance of warhead delivery capabilities during the

20 MoU, Section VII.

21 INF Treaty, Art. IX 1–4.

22 INF Treaty, Art. IX 5 (a)–(d), 6.

23 INF Treaty, Art. IX 5 (e)–(f).

24 Parties agreed that all missiles shall be eliminated 15 days prior to the end of the overall elimination period. During the last 15 days, re-entry vehicles shall be withdrawn to national territories and be destroyed, PoE II. 9.

entire process. Changes in the ratio between deployed and non-deployed IRMs and the ratio between the existing types of GLBM reflected in the MoU valid as of November 1, 1987 had to be avoided too.²⁵

2.3.1 IRM, Launchers, Support Structures and Equipment

By the end of the first phase, which ended 29 months after the Treaty came into force, no party was allowed to exceed the following numbers of intermediate-range missiles and launchers:

- an aggregate capability of deployed IRM launchers carrying or containing, at one launch, missiles deemed to carry 171 warheads;
- numbers of deployed IRM deemed to carry 180 warheads;
- aggregate numbers of deployed and non-deployed launchers capable of carrying or containing, at one launch, missiles deemed to carry 200 warheads;
- aggregate numbers of deployed and non-deployed IRM deemed to carry 200 warheads.²⁶

By the end of the second phase—i. e. no later than three years after the Treaty's coming into force—all IRM, launchers, support structures and equipment had to be eliminated.

2.3.2 SRBM, Launchers and Support Equipment

All deployed SRBMs and deployed and non-deployed SRBM-launchers had to be removed to elimination facilities by a date not later than 90 days after the Treaty's coming into force. They were to be retained there until the time of their destruction. The same applied to all non-deployed SRBMs, but within a time limit of 12 months. The elimination of all these, together with elimination of their launchers and support equipment, had to be completed not later than 18 months after the Treaty became operative. It was not permitted for SRBMs and their launchers to be gathered in the same elimination facility: they had to be separated by a distance of at least 1,000 km.²⁷

25 INF Treaty, Art. IV 2 (a), (v).

26 INF Treaty, Art. IV 2 (a), (i), (ii), (iii), (iv).

27 INF Treaty, Art. V 1–3.

2.3.3 Elimination Process and Methods of Destruction

The numerous items subject to the Treaty were scattered in approximately 160 sites across the northern hemisphere, but the elimination process required them to be concentrated at just a few elimination facilities. Thus, a significant number of movements (or “transits”) between MOB, supporting facilities and elimination sites had to be regularly notified and monitored, together with the respective changes in numbers of missiles, launchers and support equipment. Each transit had to be completed within 25 days.²⁸ Prior to the arrival of missiles at elimination facilities their nuclear warheads and guidance elements were removed, while re-entry vehicles were subject to elimination.²⁹

To keep the withdrawal process orderly and verifiable, it was obligatory for the state parties to withdraw complete organizational units, such as Pershing II batteries, BGM-109G flights, and SS-20 regiments with two or three battalions, from the deployment areas and MOBs to the elimination facilities.³⁰ However, during the first six months of the Treaty’s coming into force, both sides were allowed to eliminate up to 100 unarmed IRBM by means of launching.³¹ Within the same time frame, missiles, launchers and support equipment that had been tested prior to the Treaty becoming operative but which had never been deployed had to be eliminated too. This provision related to the U.S. Pershing IB GLBM and the Soviet RK-55 (SSC-X-4) GLCM.³²

At the elimination facilities, missiles and launchers had to be destroyed by crushing, flattening, burning, or exploding stages, by severing airframes, wings, and tail sections into two pieces of equal size, or by cutting other components in half, in accordance with the technical provisions specified in the Protocol on Elimination. These destruction processes were observed and registered by inspectors from the opposite side.³³

Fixed support structures had to be eliminated *in situ*, their superstructures dismantled or demolished and removed from their base. The foundations of fixed structures or shelters had to be destroyed by excavation or explosion. Such methods were registered and verified through on-site inspections or observation by photo-camera satellites. So that this could be done, destroyed bases had to remain visible to National Technical Means (NTM) of verification for six months, or until completion of an on-site inspection.³⁴

28 INF Treaty, Art. VIII 4.

29 PoE, II. 3, 9.

30 INF Treaty, Art. X 3.

31 INF Treaty, Art. X 4, 5; PoE, III. 2.: “No such missile shall be used as a target vehicle for a ballistic missile interceptor.”

32 INF Treaty, Art. X 6.

33 PoE, II. 7, 8, 10, with specifications for all missiles and launchers subject to the Treaty.

34 PoE, IV. 1. On NTM see section 2. f. (2) of this chapter.

Training missiles, launchers and launch canisters were generally eliminated *in situ*, subject to on-site inspections. The Treaty also permitted elimination by static display of armaments and equipment after they had been rendered unusable. For each state party, this option was limited to a total of 15 missiles, 15 launch canisters, and 15 launchers.³⁵

Deployment areas, MOBs and missile support facilities had to be eliminated by removal of all missiles, launchers and support equipment from the sites, destruction or conversion of support structures and termination of all INF-related activities such as production, flight-testing, training, repair, storage, or deployment of missiles and launchers. Elimination was counted as being accomplished once all this was certified by an inspection, or when 60 days had elapsed since the notified scheduled elimination.³⁶ In addition, conversion of any MOBs listed in the MoU for use as a base for GLBM/GLCM not subject to the Treaty was allowed, but this had to be notified no less than 30 days in advance of the scheduled conversion.³⁷

2.4 On-site Inspections (OSI)

2.4.1 Phases and Quotas for OSI

Each state party had the right to conduct on-site inspections (OSI). The Treaty provided for a variety of mutual OSI to be made, either triggered by elimination action or based on annual quotas for short-notice verification. OSI could be carried out both within the territories of state parties and within the territories of basing countries.³⁸

During the first 30 to 90 days after the Treaty came into force—i. e. between July 1 and August 29, 1988—the state parties had the right to conduct OSI of all MOBs, support facilities (other than missile production facilities), and elimination facilities. The purpose of such “baseline inspections” was to confirm the numbers and locations of missiles, launchers, support equipment and structures specified in the MoU, and thus build confidence in the reliability of the basic data.³⁹

From 90 days after the Treaty’s coming into force, each state party had the right to conduct inspections of the elimination of MOBs and missile support facilities (other than missile production facilities). Any such inspection had to be carried

35 PoE, IV. 3, V. 2.

36 INF Treaty, Art. X 8. Before the Treaty came into force, elimination of sites included in the MoU was possible without prior notification and on-site inspection. These sites were then subject to close-out inspections.

37 INF Treaty, Art. X 9.

38 INF Treaty, Art. XI 1–5, 7, 8.

39 INF Treaty, Art. XI 3.

out within 60 days of the scheduled date of the elimination of that MOB or facility, which had to be notified 30 days in advance.⁴⁰

Also from this 90-day mark, each state party had the right to conduct short-notice inspections at MOBs and support facilities (other than production and elimination facilities) to ascertain either the number of missiles, launchers and support equipment located there at the time of inspection, or to confirm the elimination of former MOBs and support facilities. This arrangement was set to last 13 years. During the first three of these years, each state party could conduct 20 short-notice inspections per calendar year; during the following five years 15 such inspections; and for the remaining five years, 10.⁴¹

2.4.2 General Procedures for OSI

In preparation for OSI, the state parties established and exchanged lists of certified aircrew members and inspectors. The lists were limited to a maximum of 200 individuals and notification of their names had to be made one day after the Treaty came into force. It was possible to amend the lists if one side refused to accept certain individuals, so long as this was done within the next 20 days. Within 30 days, individual visas had to be issued, granting the right of the listed inspectors and aircrew members to enter the territory to be inspected and remain there for the “in-country time” of the inspection. During this time, inspectors and aircrew members enjoyed special privileges and immunities.⁴²

Notification of intent to conduct an inspection had to be made through the Nuclear Risk Reduction Centers (NRRC) no less than 16 hours in advance of the estimated arrival time at the point of entry (POE). The inspected country had to acknowledge the receipt of such a request within one hour of its transmission. In cases of inspections of the completion of elimination of missiles, launchers and support equipment at elimination facilities, or of the accidental loss or static display of such items, notifications had to be issued no less than 72 hours in advance of the expected arrival time at the POE.⁴³ The NRRC of the country to be inspected would then provide a flight plan enabling entry into its national airspace. This had to be done no less than six hours before the scheduled departure time of the inspection team from the last airfield outside the territory from which they were departing. The inspection team had to specify the inspection

40 INF Treaty, Art. XI 4; PoE II. 2.

41 INF Treaty, Art. XI 5.

42 PoI, III. 2–7, Annex.

43 PoI, IV. 1. The Point of Entry (POE) is the airport specified in PoI I. 7. where inspection teams would arrive before conducting an inspection. There were two POEs each for the USSR (Moscow, Ulan Ude) and the U.S. (Washington, D. C., San Francisco, Calif.) and one each for the seven basing countries.

site they had chosen to visit no less than four hours and no more than 24 hours after arrival at the POE.⁴⁴

At the POE, an escort team from the inspected country would meet the inspection team and aircrew, the latter consisting of no more than ten individuals. The equipment of the inspectors would be examined to ensure that it could not perform functions beyond those required for the inspection. Throughout the in-country period, the inspected country was obliged to provide logistics, transportation, security protection, and medical care for the inspection team and the aircrew, bearing all costs associated with these services.⁴⁵

The escort teams accompanied the inspection teams and aircrew throughout the in-country period and organized their in-country movements. Inspectors had to keep confidentiality on the information received during their inspections. They were not allowed to hamper operations at the inspected facilities unnecessarily and had to observe safety regulations. They did, however, have the right to stay in communication with their own embassy in the inspected country throughout the inspection period using telephone communications the host country provided.⁴⁶

Inspection teams were allowed to carry the documents that were needed for inspection purposes as well as cameras, linear measurers, portable weighing and radiation detection devices, and other equipment agreed on by the parties. Escort teams had the right to observe their use. Cameras were to be used only by the inspected party. At the request of the inspectors, the in-country escort team could take photographs of the inspected facilities using the camera systems of the inspection team. These systems were capable of producing duplicate, instant-development photographic prints, and each party had the right to receive a copy of every photograph.⁴⁷

Except in the case of missile production facilities, when the inspection team arrived at the inspection site, the pre-inspection briefings and safety-related procedures had to be completed within the first hour. Immediately afterwards, the inspection had to begin. It was not to go on longer than 24 hours (except for elimination and close-out inspections).⁴⁸ Inspection teams had the right to split into sub-groups, each having at least two inspectors. Within the team as a whole, at least two inspectors were required to speak the language of the inspected country.⁴⁹

44 PoI, IV. 2–4.

45 PoI, V. 1, 4–6.

46 PoI, VI. 2, 3, 5–7, 13.

47 PoI, VI. 9, 10.

48 INF Treaty, Art. XI 7, 8. Inspections could be extended by up to eight hours if the escort agreed. POI, VI. 14.

49 PoI, VI. 15.

2.4.2.1 “Base-line,” “close-out,” and “short-notice” inspections

The INF Treaty distinguished between types of inspection and laid down special provisions. Art. XI 3. covered the initial “base-line” inspections made to verify the validity of information exchanges. Art. XI 4. covered the “close-out” inspections which verified that elimination of MOBs and missile support facilities (except for missile production facilities) had taken place. And Art. XI 5. covered the short-notice inspections that had to be conducted in accordance with specified annual quotas.

In cases of “short-notice” inspections of MOBs and support facilities (other than elimination sites and missile production facilities) and cases of eliminated former MOBs and support facilities, no more than one inspection was permitted at any one time. With “base-line inspections,” no more than ten inspections could be conducted at any one time. The inspection teams were to have no more than ten inspectors each.⁵⁰

Within one hour of the inspection site being specified, the inspected country had to implement pre-inspection movement restrictions there and ensure that no missiles, launchers, and support equipment would be removed from it before the arrival of the inspection team. The inspection team had to arrive at the site within nine hours. During their inspection, they had the right to inspect any vehicle capable of carrying banned items and, by stationing inspectors at the exits, ensure that no such vehicle could leave without being inspected.⁵¹

Members of the escort team had duties too. When the inspectors arrived, they had to deliver a briefing on the number of missiles, stages, launchers, support structures, and equipment at the site and provide a site diagram indicating their locations. The inspectors had the right to inspect the entire inspection site within the boundaries declared by the MoU, including the interiors of structures, containers or vehicles, as well as covered objects that had dimensions equal or greater than the dimensions of the armaments and support equipment specified in the MoU. As for missiles, or launch containers that could contain them, only external visual observation and measuring of dimensions was allowed. In the case of large containers, visual observation of the interior and weighing were both permitted, to ascertain that they did not carry a missile or a missile stage. In the case of launch canisters for missiles not subject to the Treaty, the inspection team had the right to make external visual observations, take linear measurements, and use radiation detection devices.⁵² If covered or shrouded objects and spaces within structures were large enough to contain banned armaments and equipment, the inspected party had to demonstrate that they did not contain such items: they had to allow visual inspection inside an enclosed space from its entrance.⁵³

50 PoI, VI. 15, VII. 4.

51 PoI, VII. 1, 2, 11–13.

52 PoI, VII. 7–9, 11, 14.

53 PoI, VII. 10.

2.4.2.2 “Elimination” inspections

The Treaty covered elimination inspections in Art. XI 7. and Art. XI 8. The provisions in the first of these texts covered how, at elimination facilities, inspectors should verify the process of eliminating missiles (including the launching of IRM as a disposal method), and also the destruction of launchers and support equipment. The second covered inspections made to confirm the completion of elimination phases of missiles, launchers, support equipment, or training missiles and launchers.

The inspection teams were to have no more than 20 inspectors each. When they arrived to verify the elimination processes, they had to be provided with a schedule of elimination activities which they could compare with the data notified in advance. The inspectors then observed the specific procedures for the elimination, making sure they followed what was required by the Protocol on Elimination. If they found any deviations, they had the right to remind the in-country escort of the need for strict compliance. Completion of the elimination of each item had to be confirmed and registered in the inspection report.⁵⁴

When missiles were eliminated by means of launching, the inspectors had the right to ascertain the type of missile prepared for launch in a visual inspection, and could then observe the launch from a safe position. They might have to observe several launches from various locations.⁵⁵ When confirming that eliminations had taken place, the inspectors had the right to inspect the results, and ascertain that all processes had been carried out in compliance with the technical procedures set out in the Protocol on Elimination.⁵⁶

2.4.2.3 Ambiguities, post-inspection activities, inspection reports, and follow-up inspections

If ambiguities arose during an inspection, inspectors had the right to request clarifications. The in-country escort team then had to take action to remove the ambiguity during the inspection. If questions relating to an object located within the inspection site could not be resolved, the inspected party had to take a photograph in order to clarify its nature and function. If it was not possible to remove the ambiguity, the question, relevant clarifications, and a copy of any photograph taken had to be included in the inspection report. All measurements recorded during the inspections needed to be certified by both teams and included in the inspection record.⁵⁷

54 PoI, VI. 15, VIII. 1.

55 Ibid.

56 PoI, VIII. 2.

57 PoI, VI. 11, 12.

Upon completion of the inspection, post-inspection procedures including finalizing the inspection report had to be concluded at the inspection site within four hours. Within two hours after the end of the inspection the inspection team had to provide the in-country escort with a written report in English and Russian language. It contained the type of inspection carried out, the inspection site, the number of missiles, stages, launchers and support equipment observed and any recorded measurements, photographs and diagrams.⁵⁸

Inspection reports had to be factual. Inspection teams had the right to note ambiguities while inspected parties could include written comments. Both were required to resolve ambiguities regarding factual information contained in the report and include relevant clarifications.⁵⁹ But neither the inspection nor the escort teams were entitled to evaluate compliance with Treaty provisions. Such assessment was reserved for governments.

In case of short-notice inspections, inspection teams had to return to the POE promptly upon completion of the post-inspection procedures and then leave the inspected country within 24 hours. Except for CPM inspections, inspection teams were entitled to conduct another inspection provided that the intent to carry out a follow-up inspection was duly notified, either after completion of post-inspection procedures or after the return of the inspection team to the POE.⁶⁰

2.5 On-site Inspections (OSI) in Basing Countries

The state parties to the INF Treaty had to conduct OSI in the basing countries as well as on each other's home territories. So agreement had to be made with these basing countries allowing inspections to be made on their territories in accordance with the Protocol of Inspection.⁶¹

On December 11, 1987, the United States concluded the INF Basing Countries Agreement with Belgium, the FRG, Italy, the Netherlands and the UK which sealed this agreement and assured that the basing countries would facilitate such inspections without assuming any obligations or rights deriving from the INF Treaty. The U. S. agreed to bear the full responsibility for Treaty implementation while respecting the basing countries' sovereign rights.⁶² Although the basing countries did not bear primary responsibility for the Treaty's implementation they became significantly involved and had to carry considerable burdens. The agreed obligations led to the establishment of additional organizational units in their armed forces and their Ministries of Defense and Foreign Affairs.

58 PoI, VI. 14, XI. 1.

59 PoI, XI. 1, 3, 4.

60 PoI, VI. 16.

61 INF Treaty, Art. XI 2; PoI II. 2.

62 Basing Countries Agreement, Art. I 1-5, VI 7.

Basing countries were obliged to establish communication channels and points of contact capable of receiving and acknowledging notification on a 24-hour continuous basis. They had to keep personnel available on short notice for in-country escorts, because both the aircrew of the inspected country and the escort team would need to include representatives of the basing country.⁶³ The inspected country had to notify the basing country when an inspecting country intended to conduct an inspection as soon as the request was received. The notification had to include the estimated date and time when the inspection team would arrive at the POE, the names of the aircrew and inspectors, and the flight plan. Basing countries retained control over their own airspace when guiding the aircraft of the inspecting country. Within 90 minutes of receipt of a flight plan, the basing country was required to provide its approval for the inspectors' plane to proceed to the POE.⁶⁴

Along with the escort team of the inspected country, basing countries had the right to escort the aircrew and inspection team of the inspecting country throughout their in-country presence. At POEs, they granted privileges and immunities to the inspectors and aircrew in accordance with the Protocol on Inspection, waived customs duties, expedited customs processing requirements as to their equipment, and provided lodging and food.⁶⁵ The POEs themselves were determined by the basing countries and included in the Protocol on Inspections.⁶⁶ Basing countries also had the right to receive the list of aircrew members and inspectors provided by the inspecting party and, under certain circumstances, could even reject named individuals. In all other cases, they agreed to provide the necessary visas within 25 days of receipt of the initial lists.⁶⁷

No less than one hour before departure of the inspection team from the POE to an inspection site or from there to another inspection site, the inspected party had to inform the basing country. The authorities in the basing country would then take all the necessary steps, such as traffic control and safety and security measures, to enable the inspection and escort team to proceed expeditiously to the inspection site and arrive there within nine hours after its designation. While the routing of such travels remained the exclusive responsibility of the basing country, the mode of transportation was determined in consultation with the escort team. The basing country also had to assist in providing logistical support for the inspection team and two-way voice communication systems between the inspection site and the inspecting party's embassy.⁶⁸

63 PoI, VII. 3; Basing Countries Agreement, Art. II 12, III 1.

64 Basing Countries Agreement, Art. III 1, 2, IV 3, V 1.

65 *Ibid.*, Art. IV 4–7, V 2. “Diplomatic aircrew escorts” were assigned to embassies of the inspected country in the basing countries for escorting aircrews of the inspecting country, Art. II 7.

66 PoI, I. 7., see also right to change POEs in Basing Countries Agreement, Art. VI 5.

67 Basing Countries Agreement, Art. IV 1, 2, 4.

68 *Ibid.*, Art. III 3, V 3–5.

After completion of the inspection, the inspected country had to brief the basing country, should the latter so request. Coordination meetings between both sides were required to discuss implementation schedules and upcoming issues. The first of these had to take place five days after the Treaty came into force; others were expected five days after either side put in a request. For immediate handling of questions there were standing communication lines between the inspected country and the basing countries.⁶⁹

The INF Basing Countries Agreement was subject to national ratification procedures, which came into force at the same time as the INF Treaty and, like it, continued for a period of thirteen years—until 31 May 2001.⁷⁰

2.6 Continuous Portal Monitoring (CPM) and National Technical Means (NTM)

In addition to on-site inspections, each state party had the right to monitor the portals of certain missile support facilities continuously with technical sensors and observe their elimination processes through National Technical Means (NTM), such as photo-reconnaissance satellites.⁷¹ This was another way of verifying compliance with the Treaty provisions.

2.6.1 Resident On-site Inspections with Continuous Portal Monitoring (CPM)

From 30 days after the Treaty came into force, each state party had the right to monitor the other side's missile production facilities continuously to ensure that no new GLBM were being manufactured. This provision was to last for 13 years. Within six months of the Treaty coming into force, resident on-site inspection teams were posted at facilities where the final assembly of GLBM stages was carried out. They operated devices for continuous portal monitoring (CPM), and these included technical sensors. These were set up to detect stages that were outwardly similar to a stage of a solid-propellant GLBM but were, in fact, not prohibited by the Treaty, for instance the Soviet SS-25 ICBM.

The provision covered facilities that had stopped production of existing types of GLBM before the Treaty came into force, and facilities that were still producing these stages that appeared so similar to the banned GLBM. However, if a party refrained from the final assembly of these look-alike stages for 12 consecutive months after the end of the second year of the Treaty's coming into operation, this provision ceased—unless a party restarted this kind of assembly at a later date.

69 Ibid, Art. VI 1–3, 6.

70 Ibid, Art. VII.

71 INF Treaty, Art. XI 6, XII 1.

Early on, the U.S. Hercules Plant No. 1 at Magna, Utah, and the Soviet Votkinsk Machine Building Plant, Udmurt ASSR in the Russian SFSR were earmarked for CPM inspections.⁷²

For CPM inspections, the inspected country had to maintain an agreed perimeter around the periphery of the inspection site and designate a portal with no more than a single rail line and one road running in parallel, not more than 50 meters apart. All vehicles capable of containing an IRBM or the longest stage of this type of missile had to exit through this portal alone. Only two other exits from the inspection site were permitted, and these were monitored by technical sensors.⁷³

An inspection team of no more than 30 inspectors had the right to install CPM systems at the portal and additional exits, and carry out the necessary engineering surveys, construction, repair and replacement of monitoring systems for all this to work. The systems could include weight sensors, vehicle sensors, surveillance systems such as photo and infrared cameras, dimensional measuring equipment to examine vehicle and missile stages, and non-damaging X-ray image-producing sensors for imaging the contents of launch canisters or shipping containers. Inspectors could use their own two-way radio communication systems and patrol the whole perimeter of the site.⁷⁴

At the expense of the inspecting party, the inspected party had to provide all the utilities needed for the construction and operation of the CPM system, including a center for data collection, at least two telephone lines, and high frequency radio equipment to enable the inspecting team to communicate with its embassy in the inspected country. The inspection team had the right to build up to three buildings outside the perimeter of the inspection site for their data center and team headquarters, plus an additional building for the storage of supplies and equipment.⁷⁵

Any shipment exiting through the portals of the site capable of containing an IRBM or the longest stage of one of these missiles had to be declared by the inspected party in advance, and that declaration had to be accompanied by a statement that the shipment contained no banned items. The inspection team had the right to weigh and measure the dimensions of suspect vehicles and railcars. When vehicles with the capability of carrying banned items exited the portals, the inspection team was entitled to inspect its interior or ensure by outside visual observation that no containers or shrouded objects contained an IRBM or its longest stage. Otherwise, the inspected party had to demonstrate fully that no such banned items were being carried.⁷⁶

If a vehicle exiting the portals was declared to contain missiles or stages as heavy, or heavier, than IRBM—intercontinental ballistic missiles (ICBM) for

72 INF Treaty, Art. XI 6.

73 PoI, IX. 1.

74 PoI, VI. 15, IX. 3, 4, 6 (b)-(d), 9.

75 PoI, IX. 6 (a), X. 5.

76 PoI, IX. 11, 13.

instance—the inspection team had to place measuring equipment outside the launch canister or shipping container and have this certified by the in-country escort. Inspection teams were allowed to view, weigh, and take measurements of the dimensions of suspect missiles and stages in launch canisters or shipping containers up to eight times per calendar year, in the presence of the escort team.⁷⁷

Within three days of the end of each month, the team leaders of CPM inspections had to provide their in-country escort with a written inspection report in English and in Russian. This had to be factual and had to include the number of vehicles leaving the inspection site declared to have contained a missile or stage as large, or larger than, and as heavy, or heavier than, an intermediate-range GLBM or the longest stage of such a missile. The report had also to include details of any measurements taken of launch canisters or containers carried by the recorded vehicles, and the length and diameter of missile stages inspected through visual observation.⁷⁸

2.6.2 National Technical Means (NTM)

In addition to on-site inspections, reductions were certified through National Technical Means (NTM), in other words, by satellite observation. In this case, support structures eliminated *in situ* had to remain visible to NTM for six months after the notified date of completion or until an on-site inspection was done.⁷⁹ To ensure unhindered operation of NTM for verification purposes, the Treaty prohibited any interference with the use of photo-reconnaissance satellites and the impediment of such observation by concealment of missiles, launchers and support equipment. As such verification methods only applied to the INF elimination process, normal concealment practices within deployment areas associated with training, maintenance and operations, or the use of environmental shelters to protect missiles and launchers continued to be allowed.⁸⁰

So that they could distinguish between IRBM and strategic ballistic missiles with an intercontinental range (ICBM), parties could request the implementation of cooperative measures at specified deployment bases for road-mobile GLBM with a range capability in excess of 5,500 km, even when these bases were not former MOBs and were not subject to the INF Treaty elimination provisions. No later than six hours after such a request, the parties to whom a request was made had to open the roofs of all fixed structures for launchers at one specified deployment base and display the missiles or launchers kept there in the open, without resorting to concealment measures. The roofs had to be left open for 12 hours following the receipt of the request. Such cooperative measures could

77 PoI, IX. 14.

78 PoI, XI. 2.

79 PoE, IV. 1.

80 INF Treaty, Art. XII 1, 2.

be requested a maximum of six times per calendar year until a treaty on the limitation of strategic arms (START) came into force, but otherwise for no more than three years after the INF Treaty became operative.⁸¹

2.7 Nuclear Risk Reduction Centers (NRRC) and Special Verification Commission (SVC)

The state parties to the INF Treaty agreed to use their Nuclear Risk Reduction Centers (NRRC) as continuous communication channels to exchange data and provide and receive the notifications and information required by the Treaty.⁸² Such centers, operating 24 hours every day, were established on September 15, 1987, on the basis of a bilateral agreement to keep permanent satellite communication links relating to impending ballistic missile launches, nuclear accidents, or naval incidents at sea.⁸³

To promote the objectives and implementation of the provisions of the Treaty, the parties established a Special Verification Commission (SVC). The SVC convened at the request of either of the parties and met regularly for several weeks per session in Geneva, Switzerland. It was tasked with resolving questions of compliance and agreeing on measures to improve the viability and effectiveness of the Treaty.⁸⁴ Even before the Treaty came into force, senior representatives of both verification agencies had held three bilateral technical talks in Washington, Moscow, and Vienna to discuss details relating to aircraft and crews, notification formats, inspection procedures, and CPM activities. These talks took place in the period from March to May 1988, and had reached an understanding about the interpretation of nine Treaty issues by mid-May. Once this had been achieved, formal diplomatic notes were exchanged, and these “diplomatic minutes” became part of the Treaty’s documents.⁸⁵ On December 20, 1988, a Memorandum of Understanding on procedures for SVC operations was signed.⁸⁶

81 INF Treaty, Art. XII 3.

82 INF Treaty, Art. XIII 2.

83 FAS Weapons of Mass Destruction, Intermediate-Range Nuclear Forces (INF) Chronology, <https://fas.org/nuk/control/inf/inf-chron.htm>.

84 INF Treaty, Art. XIII 1.

85 U.S. Department of State. *Diplomacy in Action. Bureau of Arms Control, Verification, and Compliance. Treaty Between The United States of America And The Union of Soviet Socialist Republics On The Elimination Of Their Intermediate-Range And Shorter-Range Missiles (INF Treaty), Signed December 8, 1987*, <https://2009-2017.state.gov/t/avc/trty/102360.htm#diplomaticnotes>; Joseph P. Harahan, *On-Site Inspections under the INF Treaty. A History of the On-Site Inspection Agency and INF Treaty Implementation, 1988–1991. Treaty History Series. Published by On-Site Inspection Agency, Washington, D. C. 1993, Chapter 2*, <https://fas.org/nuke/control/inf/infbook/ch1a.html>.

86 Memorandum of Understanding Between the Government of the United States of America and the Government of the Union of Soviet Socialist Republics Regarding Procedures for the Operation of the Special Verification Commission, December 20, 1988.

On December 21, 1989, after gaining considerable experience with the operation of the Treaty and making steady improvement on a “provisional basis,” senior representatives of the SVC from the United States and the Soviet Union signed a Memorandum of Agreement, in Geneva, to enhance the implementation of the verification provisions of the Treaty. The Memorandum contained detailed clarifications concerning inspection notifications, refined or alternative methods of destruction, permitted radiation measuring devices, and CPM operations. Lists of clearance numbers, navigation equipment, air routes, and types of inspection aircraft appeared in annexes to the Memorandum, as did details of agreed inspection equipment, measurement devices, cameras, sensors, and detectors.⁸⁷

3. The Elimination and Verification Process of the INF Treaty 1988–2001

The elimination of thousands of missiles, stages, launchers and supporting structures and equipment within the three-year timespan stipulated by the INF Treaty, together with the proper verification of the process, posed a significant challenge in terms of resources, expertise and preparatory training. On-site inspections and escort activities covered five types of inspection in 130 Soviet inspection sites in the USSR, the GDR and ČSSR, and 31 U.S. inspection sites in the United States, West Germany, Belgium, Italy, the Netherlands, and the United Kingdom.

The verification agencies were faced with the largest verification operations ever conducted up to that point in peacetime history. Their task required the exchange of thousands of notifications and information details, as they carried out hundreds of OSI at MOBs, support facilities, test sites, former production or assembly facilities, and elimination sites. The armories and equipment in these places contained thousands of items to be checked. After the INF Treaty came into effect, the exchanges of messages through the NRRCs multiplied dramatically as enormous quantities of INF-related notifications and information came to be communicated on a daily basis. In the first full year of the Treaty’s enforcement, the United States and the Soviet Union had the right to carry out more than 340 on-site inspections. More than 200 inspections had already been conducted by December 20, 1988.⁸⁸ The inspectors had to monitor and certify that elimination obligations had been fulfilled according to the timelines established.

87 Memorandum of Agreement Regarding the Implementation of the Verification Provisions of the Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Elimination of Their Intermediate-Range and Shorter-Range Missiles, Geneva, December 21, 1989 (print July 1990), United States Information Service, Brussels, Belgium.

88 Harahan, *On-Site Inspections under the INF Treaty*, Chapter 1, 3.

3.1 Organizational Aspects

On January, 15, 1988 President Reagan instructed Secretary of Defence Frank Carlucci to establish the On-Site Inspection Agency (OSIA) in Dulles International Airport outside Washington D.C., to implement the unprecedented inspection and escort obligations enshrined in the Treaty.⁸⁹ OSIA, with an annual budget of \$ 120 million, created two divisions with up to 200 experts and linguists for the conduct of inspections in the Soviet Union, the GDR and ČSSR, and for escorting Soviet inspection teams in the United States and in five European basing countries. There were also up to 200 people in the aircrews that were required. For portal monitoring in Votkinsk, USSR, OSIA set up a specific directorate: as teams of 30 inspectors had to be continuously present for 365 days a year, a larger pool of personnel was needed allowing for replacements in several shifts.

In addition, OSIA established field offices with escort teams at the two in-country POEs in Washington D.C. and San Francisco, California, one field office at the POE Frankfurt/Main, West-Germany for the five basing countries in Europe, and another field office in Tokyo, Japan for inspections in the Asian part of the Soviet Union. The field office in Frankfurt/Main was also used as a “gateway” for inspections in the western part of the Soviet Union through the POE in Moscow while inspections in the eastern part of the Soviet Union via POE Ulan Ude were dispatched from the Yokota Airbase, Tokyo. The State Department assigned an Arms Control Implementation Unit (ACIU) to the U.S. embassy in Moscow, a sub-unit to the POE Ulan Ude, and “diplomatic aircrew escort” units to embassies in the basing countries.⁹⁰ The U.S. Air Force, which operated the GLCM BGM-109G Tomahawk, and the U.S. Army, which held the GLBM Pershing II and Pershing IA, remained responsible for decommissioning, transporting and eliminating the missiles, launchers, support equipment and structures of these systems.

In the Soviet Union, preparations for the INF elimination process were organized in similar ways. The Soviet NRRC, which operated in the Ministry of Defense in Moscow, played a crucial role in the implementation of the Treaty. It was not only entrusted with the permanent and immediate communication of all INF-related information and notifications but also assumed the task of preparing and conducting all INF inspection and escort activities. While the Soviet Strategic Rocket Forces that operated INF missiles were responsible for decommissioning, transporting and eliminating the missiles and associated equipment and structures, the NRRC coordinated all such Treaty-related operations, with the one exception of overseeing the CPM system at the missile production plant

89 National Security Decision Directive 296 of January 15, 1988, cited in: FAS Weapons of Mass Destruction. Intermediate-Range Nuclear Forces (INF).

90 Harahan, On-Site Inspections under the INF Treaty, Chapter 1.

in Votkinsk, which was managed by the Ministry of Defense Industries.⁹¹ The Soviet Ministry of Foreign Affairs established arms control implementation units in the Soviet embassy in Washington D. C. and in the consulate general in San Francisco.

After establishing the verification agencies in the two months preceding the coming into force of the Treaty, both sides conducted a series of mock inspections in the inspection sites they had in national territories and basing countries to establish the capabilities and routines needed to implement the verification provisions. Temporary housing quarters were built in Soviet and U. S. inspection sites in the United States, Europe and the Soviet Union to accommodate the inspection teams.

3.2 INF Baseline Inspections

INF baseline inspections in 164 sites began on July 1, 1988, and lasted for 60 days up to August 29, 1988. Their purpose was to check and buildup trust in the reliability of the data exchange established in the MoU as of November 1, 1987 and the first update notification of July 1, 1988, according to which a total of 1,846 Soviet and 846 U. S. deployed and non-deployed missiles, launchers and support equipment had to be verified. The figures can be seen in Table 3.

Table 3: Items Checked in Baseline Inspections, July to August 1988.

	USSR	U.S.A
IR-GLBM	654 SS-20 149 SS-4 6 SS-5	234 Pershing II
IR-GLCM	80 SSC-X-4	443 BGM-109G
<i>Sum IR-INF</i>	889	677
SRBM	718 SS-12 239 SS-23	169 Pershing 1A
<i>Sum SR-INF</i>	957	169
Total INF missiles	1,846	846
Total INF launchers	825	289
Total Treaty-limited items	5,439	2,332

91 Ibid, Chapter 4.

These armaments and their items of support equipment were located, on the one side, at 130 dispersed Soviet inspection sites in the Soviet Union and in two of its basing countries, and, on the other side, in 31 more concentrated U.S. inspection sites in the United States and five of the U.S.'s basing countries. The update numbers communicated reflected corrections to the numbers contained in the data exchange of November 1, 1987, as the MoU had not at that time included U.S. elimination facilities and (using different counting criteria) had double-counted missile support facilities that were actually located at the same sites. The Soviet Union had established eight elimination sites; the United States, four.

Both state parties conducted baseline inspections at all MOBs and support facilities (except for production plants) between July 1 and August 29, 1988. Given the dispersal of all Treaty-limited armaments and equipment over approximately 160 sites, these sixty days were the most intensive ones during the whole elimination and verification process. The inspection teams sometimes had to conduct several consecutive inspections per week. All the inspection teams consisted of ten inspectors, including a team leader, a deputy team leader and two linguists.

OSIA had organized 20 inspection teams, which began activities via the POEs in Moscow and Ulan Ude on July 1, 1988, and which carried out 129 inspections by August 29. Sixteen of these inspections were counted as close-out inspections, as the inspected MOBs and facilities declared that they no longer had any missile systems, launchers, or associated equipment. On July 31, U.S. inspection teams had already conducted approximately 50 inspections in the Soviet Union, the GDR and Czechoslovakia, a number that rose to 108 by August 18. By that time, an additional four elimination inspections at elimination facilities had been carried out while one larger team of resident inspectors had begun the CPM inspection at the Votkinsk missile production plant.⁹²

The Soviet Union also started inspections as soon as the baseline inspection period began, with 72 inspectors arriving at Travis AFB, California on July 1, 1988. These 72 consisted of five inspection teams with ten inspectors each for baseline inspections and one 22-person inspection team tasked with setting up the CPM system at Hercules Plant No. 1 in Magna, Utah. On July 4, Soviet inspectors started inspections in Europe with a baseline inspection of the BGM-109G Tomahawk MOB in Wüschheim and the Pershing II MOB in Schwäbisch Gmünd, both in West-Germany. By the end of July, Soviet inspection teams had inspected 13 U.S. MOBs and facilities in the United States and Western Europe, a number that had increased to 26 (out of a total of 30) by August, 18.⁹³

By the end of the baseline period on August 29, 1988, U.S. teams had inspected 79 Soviet INF MOBs, 19 missile and launcher storage facilities, 6 training facilities, 2 test ranges, 12 repair facilities, 3 production facilities, and 8 elimination facilities; while Soviet inspectors had conducted 31 baseline inspections of U.S. MOBs and missile support facilities. Special inspections by U.S. teams in six

92 Ibid.

93 Ibid.

Soviet elimination sites and by Soviet teams in three U.S. elimination sites took on the task of measuring and updating the length, width, height, and weight of all missiles subject to the Treaty. The data harvested in this way then became the standard for all subsequent inspections. Altogether, in the first 60 days of the Treaty's implementation, the U.S. Airforce flew 54 missions from Frankfurt to Moscow and 31 missions with 36 teams from Tokyo to Ulan Ude. If the in-country escort missions are included, the Military Airlift Command flew 185 INF teams on 114 baseline inspection missions.⁹⁴

The initial baseline inspections were crucial not only in establishing logistics, flight activities and numbers of personnel involved but, especially, in the operational and political impact they achieved. They could either establish trust in the reliability of data exchange or destroy the whole implementation process, which would then have severe political consequences during a critical time of détente. The outcome, however, was encouraging. Both sides were able and eager to put into practice the procedures that had been set out in the Protocol on Inspections. The inspection teams gained significant additional knowledge about each other's forces, operations and doctrines and friendly professional relations were built up between the inspectors and their escorts. In general, the inspection results confirmed the validity of the data exchanges of November 1, 1987, and July 1, 1988. Overall, there was a growth of trust not only in the viability of the Treaty's concepts but in how each side saw the other's intentions.

3.3 INF Continuous Portal Monitoring (CPM) Inspections

The aim of INF continuous portal monitoring (CPM) inspections was to verify that the parties to the Treaty stopped production of INF missiles. To that end, a U.S. resident on-site inspection team was stationed at the Votkinsk Machine Building Plant, Udmurt ASSR in the Russian SFSR, and a Soviet team at the Hercules Plant No. 1 at Magna, Utah. Inspections were scheduled to start 30 days after the Treaty came into force. Five months later, teams of up to 30 inspectors were entitled to buildup a CPM system with the assistance of the host state, so they could confirm that no new INF missiles were being produced.

Inspectors had to be stationed outside the periphery of the plant they were observing. Their task was to patrol the periphery, including the portals, and operate the required sensors at the permitted main portal and at two side portals. They were allowed to use approved sensors and non-damaging imaging (X-rays) to weigh, measure, and image rail cars and trucks large enough to contain an INF missile. Eight times a year, they also had the right to inspect containers or launch-canisters visually from inside. These had to be opened for that purpose by the inspected side. At no time did the inspectors have the right to enter the plant itself.

94 Ibid.

This last proviso was important because, in the Votkinsk production plant, the Soviet Union continued building missiles that were not subject to the Treaty, but were “outwardly similar to a stage of solid-propellant GLBM.”⁹⁵ At Votkinsk, the production of SS-20 IRBM and SS-12 and SS-23 SRBM had been stopped, while the final assembly of SS-25 ICBM continued. The second stages of both missile types were quite similar and their length differed by only a few centimeters. The Hercules Plant No. 1 at Magna, Utah, had produced Pershing II rocket motors from 1982 to 1987. Here too, an average of 400 to 500 vehicles entered and left every day.⁹⁶

Both sides had prepared extensive CPM systems during technical talks and mutual expert visits in the spring of 1988. They started to station inspectors and buildup such systems on July 2, 1988. Sensors, communication assets, headquarters and permanent residence equipment had to be flown in and then transported via rail and road. The U.S. chose to install non-damaging radiographic sensors (CargoScan) used together with infrared profilers to monitor road and rail traffic at the Votkinsk plant but relinquished weighing scales, which were also authorized by the Treaty. The Soviet Union did not install an imaging system at the Magna plant but did use road and rail weighing scales. However, it took more than a year for this equipment and the U.S. CargoScan sensors to be put in place, and initially inspections had to be carried out visually.⁹⁷ During the installation phase, these differences caused some controversies, since all equipment had to be approved by the inspected party. Furthermore, the U.S. used contractors (Hughes Technical Services) to operate and maintain the monitoring system in Votkinsk under the supervision of an OSIA site commander and his staff. Eventually, the INF Treaty Memorandum of Agreement⁹⁸ of December 21, 1989, standardized the sensors and equipment that could be used for CPM inspections.

Despite this agreement, a major issue arose in February 1989 when the Soviet side voiced concerns about the operation of the CargoScan system at Votkinsk. The concerns related to magnetic tape storage, joint operations procedures, and X-ray safety procedures. In March, the crisis reached a nadir when the Soviet side declared that three cargo railcars leaving the plant and containing missile stages should be barred from U.S. cargo scanning because it had not yet been agreed that the CargoScan equipment was ready for use. The U.S. team was confined to visual and manual inspection only.

This incident at Votkinsk lasted from March 1 to March 9, 1989. The U.S. Secretary of State, James A. Baker, filed an official complaint with Soviet Foreign Minister Eduard A. Shevardnadze. Subsequently, the two sides sent expert delegations to Votkinsk to solve the issue. After five days of meetings, the delegations

95 INF Treaty, Art. XI 6 (a).

96 Harahan, On-Site Inspections under the INF Treaty, Chapter 5.

97 Ibid.

98 Memorandum of Agreement Regarding the Implementation of the Verification Provisions of the INF Treaty.

“agreed to technical and operational steps that addressed Soviet concerns without altering Treaty provisions, while the Soviet side agreed that the CargoScan system could become operational.”⁹⁹ Once this issue had been resolved, CPM inspections were conducted in accordance with the agreed provisions and no further problems occurred throughout the period of operation, although inspection teams rotated several times.

Twenty-four-hour monitoring required dividing the teams into shifts and sub-groups to operate the CPM system, document and register data, patrol the perimeter and carry out headquarters tasks such as organizing daily work schedules, keeping up communications with embassies, and coordinating with escorts, using their own linguistic capabilities. All daily reports, including the acquired data, were compiled in monthly Portal Monitoring Inspection Reports, which were exchanged between both parties. Daily operations continued to be carried out smoothly until the regime was transformed into the Perimeter and Portal Control System of the START I Treaty of July 31, 1991.¹⁰⁰

3.4 INF Elimination Inspections

The objectives of the INF elimination inspections were to observe and confirm that all eliminations were carried out completely within the Treaty timelines and in accordance with the destruction or conversion provisions of the elimination protocol. The protocol distinguished between

- (1) OSI to monitor the elimination of fixed structures of MOBs and missile support facilities (excluding missile production facilities), that would be carried out *in situ* within 60 days after the scheduled date of that elimination;
- (2) OSI to monitor the elimination of IRM and SRBM, their launchers, and support equipment at *elimination facilities*, which had to be notified at least 30 days in advance;
- (3) OSI to monitor the elimination of IRM by *launching* within the first six months of the Treaty’s coming into force, which had to be notified at least 10 days in advance of the launching. The same rule applied for launches of research and development boosters.

The revised data exchange of July 1, 1988 specified eight Soviet and four U.S. elimination sites together with the designation of types and numbers of missiles that would be eliminated at each site.

The U.S. side declared that it would eliminate its 846 missiles at the following sites:

- 169 Pershing IA GLBM and a portion of the Pershing II GLBM stages at Longhorn Army Ammunition Plant in Marshall, Texas;

99 Harahan, On-Site Inspections under the INF Treaty, Chapter 5.

100 Pifer et al., The Treaty on Intermediate-Range Nuclear Forces, p. 21.

- another portion of the total of 234 Pershing II GLBM and selected Pershing II launchers at the Pueblo Depot Activity in Pueblo, Colorado;
- the bulk of Pershing II launchers at the U.S. Army Equipment Maintenance Center (EMC) in Frankfurt-Hausen, West Germany;
- 443 BGM-109G GLCM and their launchers, operated by the U.S. Air Force, at Davis-Monthan Air Force Base in Tucson, Arizona.

The 1,846 INF missiles of the Soviet Union were eliminated at the following eight sites:

- the deployment areas at Kansk and Chita in the eastern USSR, which were used for the launch of 72 unarmed SS-20 GLBM, as the Treaty permitted this method for up to 100 IRBM within the first six months of its coming into force—i. e. up to December 1, 1988;
- the test range Kapustin Yar by the Caspian Sea and the elimination facility at Sarny, which served for the destruction of 582 SS-20 IRBM and support equipment by explosive demolition;
- the Lesnaya elimination facility for the destruction of 155 SS-4/-5 missiles and their support equipment;
- Jelgava, in the western part of the USSR, for the elimination of 80 non-deployed SSC-X-4 missiles and launchers;
- Saryozek in Kazakhstan for the elimination of 957 SS-12 and SS-23 SRBMs, which had to be destroyed within 18 months after the Treaty came into force—i. e. by December 1, 1989;
- the Stan'kovo elimination site in western USSR, more than 1,000 km distant from Saryozek, where transporter erector launcher (TEL) vehicles for SS-12 and SS-23 SRBM were destroyed.

Operational parity had to be maintained in the numbers of deployed IRM warheads during the destruction process, and this required coordination of the withdrawal and elimination schedules. Within 29 months after the Treaty's coming into force, both sides had to reduce their IRM launchers so that no side could field more than 171 deployed IRM warheads.¹⁰¹ Thus, by November 1, 1990, the Soviets were allowed to deploy no more than 57 SS-20 IRBM, each carrying three warheads, while the U. S. still had *carte blanche* to field all 120 Pershing II in Europe, since they carried one warhead only. In reality by that time, however, the U.S. had reduced the number of Pershing II IRBMs stationed in West-Germany down to 66 missiles.¹⁰²

Disparity of SRBM numbers—957 deployed and non-deployed Soviet SS-12 and SS-23, as opposed to 169 non-deployed U.S. Pershing IA—also implied that the Soviet Union had to eliminate missiles at much higher destruction rates than

101 INF Treaty, Art. IV 2 (a).

102 See Memorandum, February 1, 1988, in: AAPD 1988, Doc. 46, p. 260. However, the memo, does not mention the 12 “non-deployed” Pershing IIs in Weilerbach.

the U.S. This appeared to be so right up to December 1, 1989, the date when the elimination of all SRBMs had to be completed.

All eliminations were monitored and certified by inspection teams consisting of up to 20 persons. Inspected parties had to notify eliminations, at latest, 30 days before initiation; inspecting parties had to notify the arrival of inspection teams no later than 72 hours in advance. The inspectors had the right to stay in the inspection site and observe the elimination process up to the scheduled time of its completion and the certification of results in the inspection reports. On average, scheduled elimination processes in elimination facilities lasted for ten days.

The U.S. started the elimination of 169 Pershing IA SRBM on September 8, 1988 with the destruction of the first Pershing IA at Longhorn Army Ammunition Plant in Marshall, Texas. The last Pershing IA was destroyed on July 6, 1989. Destruction of Pershing IA launchers began in December 1988 at the Pueblo Depot Activity in Pueblo, Colorado, and was completed by July 1, 1989. Elimination of Pershing II GLBM missile stages was carried out at the Pueblo Depot Activity too, and the last Pershing II missile stages were destroyed there on May 6, 1991. In October 1988 elimination of Pershing II launchers started at EMC Hausen in West Germany. The last Pershing II launcher in Europe was destroyed there on April 16, 1991.

The elimination of the 443 BGM-109G GLCM, launch canisters and launchers began in October 1988 at the Davis-Monthan AFB in Tucson, Arizona, and proceeded at a rate of approximately 40 systems per month. The last U.S. GLCM was destroyed on May 1, 1991. GLCM and Pershing II deployed in MOBs in Western Europe had to be removed in operational units—GLBM batteries and GLCM flights—and be withdrawn to elimination sites within 25 days. Getting them to these sites included withdrawal from operational status, transport via road and rail through Germany and then by airlift from Frankfurt, Stuttgart or Ramstein AFB to the U.S., and finally again by road and rail.

All 169 Pershing IA SRBM were eliminated in the first Treaty year, and the elimination rates shown in Table 4 were achieved for the 234 Pershing II GLBM and the 443 BGM-109G GLCM.¹⁰³

Table 4: Elimination Rates for Pershing II GLBM and BGM-109G GLCM.

	1988/89	1989/90	1990/91
234 Pershing II	34	72 (106)	128 (234)
443 GLCM	130	90 (220)	223 (443)
677 IR-INF	164	162 (322)	351 (677)

Cumulative numbers in brackets

103 Harahan, On-Site Inspections under the INF Treaty, Chapter 6; on the chronology of elimination see also FAS Weapons of Mass Destruction, Intermediate-Range Nuclear Forces (INF) Chronology, <https://fas.org/nuk/control/inf/inf-chron.htm>.

The Soviet side began eliminations at the Kapustin Yar missile test range with the demolition of an SS-20 IRBM by explosion. Then 72 SS-20 missiles were destroyed by launch from the Chita and Kansk MOBs in the fall of 1988. On August 1, 1988, the first SS-12 SRBM was destroyed at Saryozek, again by explosion. The last SS-23 was destroyed on July 25, 1989. The SS-12 and SS-23 launchers and support equipment were destroyed at Stan'kovo elimination site before November 1, 1989, ahead of schedule. The last SS-4 and SS-5 missiles were eliminated at Lesnaya May 22, 1990 and August 16, 1990.

The USSR started eliminations during the baseline inspection phase with enormous speed. This was because it had to cope with a much higher number of items to destroy than the U.S., in particular its large arsenal of SRBMs. Already by the end of the first Treaty year, it had destroyed almost one-third of its SS-20, all SS-4 and SSC-X-4 and 83 per cent of SS-12 SRBM. On May 12, 1991, the last SS-20 IRBM was destroyed in Kapustin Yar.

In sum, the Soviet side achieved the elimination rates shown in Table 5.¹⁰⁴

Table 5: Elimination Rates for Soviet INF.

	1988/89	1989/90	1990/91
654 SS-20	192	262 (454)	200 (654)
149 SS-4	149	0 (149)	0
6 SS-5	1	5 (6)	0
80 SSC-X-4	80	0 (80)	0
<i>Total IR-INF</i>	<i>422</i>	<i>267 (689)</i>	<i>200 (889)</i>
718 SS-12	600	118 (718)	0 (718)
239 SS-23	0	239 (239)	0 (239)
<i>Total SR-INF</i>	<i>600</i>	<i>357 (957)</i>	<i>0 (957)</i>

Cumulative numbers in brackets

By May 31, 1991, all eliminations required by the INF Treaty had been carried out in compliance with Treaty provisions and ahead of timelines. By that time, more than 400 on-site inspections by OSIA and 230 on-site inspections by the Soviet NRRC had been conducted.

104 Ibid.

3.5 INF Close-out Inspections

INF close-out inspections in both elimination facilities and the fixed structures of MOBs and support facilities had to be carried out, once elimination was declared completed at these sites. These inspections were tasked with certifying that all elimination obligations had been fulfilled and that the site under observation was indeed closed. The inspected parties had to show that they had removed all INF missiles, launchers and associated equipment from that facility, had ceased any INF related activities there, and had dismantled, destroyed, or converted to other purposes all support facilities such as missile and launcher structures or launch pads. The sites could be accepted as closed after their on-site inspection had certified that this had been achieved, or after 60 days had elapsed from the closure declaration.

All declared inspection sites had to be closed within three years of the Treaty going into operation—at the latest by 31 May, 1991. If parties to the Treaty declared that certain sites had already fulfilled such requirements before the Treaty came into force, baseline inspections could be counted as close-out inspections. Both the U. S. and the Soviet Union had prepared a number of INF sites for elimination in advance. The presence of MOBs and facilities without listed missiles and support equipment in the MoU data update explain why close-out inspections had already started during the baseline inspection phase in the summer of 1988.

Among the first close-out inspections was one at the M. I. Kalinin Machine Building Plant in Sverdlovsk where the Soviet SSC-X-4 GLCM had been produced, but where production had ceased prior to the Treaty's coming into force. Similarly, the V. I. Lenin Heavy Machine Building Plant in Petropavlovsk, Kazakhstan, had terminated production of SS-23 missiles prior to that date. Two U. S. inspection teams carried out close-out inspections in both facilities as early as July 17 and July 21, 1988. They confirmed that missile production had indeed ceased. At the same time, another U. S. team traveled to the Soviet SS-12 MOB at Hranice in the ČSSR, where Soviet missiles had already been withdrawn in March 1988. The Soviet escort team included representatives of the host country, following bilateral agreements the Soviet Union had concluded with both the ČSSR and the GDR.¹⁰⁵ Altogether OSIA carried out 16 close-out inspection during the baseline inspection period.

The Soviet side conducted five close-out inspections during this period. They began on July 3, 1988 with the Dugway Proving Grounds in Utah, a former test range for GLCMs, and the Air Force Plant 19 in California, a former production plant for GLCM launchers. More inspections followed on August 4, 1988 at the Missile Test Range Complex 16 at Cape Canaveral, Florida, and the Martin

105 Harahan, *On-Site Inspections under the INF Treaty*, Chapter 7; see also *FAS Weapons of Mass Destruction, Intermediate-Range Nuclear Forces (INF) Chronology*.

Marietta Pershing IA Launcher Production Facility in Middle River, Maryland. In the summer of 1988, a Soviet team inspected the BGM-109G GLCM MOB in Woensdrecht in the Netherlands, where no missiles, launchers and support equipment had been reported in the MoU or the data update of June 1, 1988.

After the initial baseline period, another phase of routine close-out inspections started up, following the process of gradual elimination of MOBs and support facilities in accordance with the timelines specified in the Treaty. Thus in the first 90 days after the Treaty came into force, all deployed SRBM SS-12 and SS-23 and all SRBM launchers had to be withdrawn from 18 MOBs under Soviet control—11 in the Soviet Union, six in the GDR, and one in Czechoslovakia—and be taken to elimination sites. Within 12 months all non-deployed SRBM from other facilities had to go to their elimination sites. The process of SRBM elimination had to be concluded within the next 18 months, i. e. by December 1, 1989. Subsequently, SRBM MOBs and support facilities were successively closed-out. In parallel, all SS-4 and a number of SS-20 MOBs were closed while the last SS-20 MOBs were eventually eliminated in the last six months of the total elimination period.

In Europe, the sequence of closure of U. S. MOBs followed the still unfinished build-up of their operational status. It started with Woensdrecht in the Netherlands, where no GLCMs (BGM-109G Tomahawk) were yet stationed. The U. S. Air Force had only just begun to deploy GLCMs in MOB Molesworth in the UK when the Treaty came into force, and this base was scheduled for closure in the fall of 1988 with an official notification in December. A Soviet inspection was carried out there on January 19, 1989. Similarly, in MOB Florennes in Belgium, the stationing of GLCM had not been completed in the summer of 1988. Consequently, withdrawal of its missiles started in the fall and was accomplished by December 13, 1988. A Soviet close-out inspection on March 10, 1989, certified the closure of the base.¹⁰⁶

In contrast, all three Pershing II MOBs (initially 120 missiles) in West Germany remained active throughout the first two years of the Treaty's operations in order to maintain the parity in warhead delivery capabilities stipulated in the Treaty.¹⁰⁷ Also still active in the second Treaty year were: the large GLCM (BGM-109G Tomahawk) MOBs at Greenham Common, in the UK (initially 101 missiles, 29 launchers); at Comiso in Italy (initially 108 missiles, 31 launchers) and at Wüschheim, West Germany (initially 62 missiles, 31 launchers), as well as support facilities in Weilerbach and Frankfurt-Hausen, West Germany, and at Grosselies, Belgium.

Between June and December 1990 the three sites at Groselies, Belgium, and Wüschheim and Waldheide-Neckarsulm, West Germany were declared closed and were inspected. The remaining 21 U. S. INF sites, including the MOBs at

106 *Ibid.*

107 The West German Foreign Office noted on February 1, 1989, that by December 31, 1988, the U. S. had withdrawn 27 Pershing II from the FRG and 64 GLCM from Belgium, Italy, and the UK. Cf. AAPD 1989, Doc. 12, Anm. 7, p. 54.

Greenham Common, U. K., Neu-Ulm and Schwäbisch-Gmünd, West Germany, along with the support facilities in Weilerbach and Frankfurt-Hausen, West Germany, were closed between December 1990 and May 1991.

Though, in late April and May 1991, both sides made declarations that the last remaining INF MOBs and support facilities had been closed, close-out inspections were still conducted throughout the summer and up to August of that year. The closure of 31 U. S. and 133 Soviet¹⁰⁸ former INF sites was confirmed by close-out inspections in the sequence shown in Table 6.

Table 6: Confirmed Closed INF Sites.

	1 st Treaty Year 1988/89	2 nd Treaty Year 1989/90	3 rd Treaty Year 1990/91
31 U.S sites	7	0	24
133 Soviet sites	50	36	47

Closure of INF bases could include conversion to either civilian or alternative military purposes. Thus, a number of Soviet MOBs were converted to missile operation bases for mobile SS-25 ICBM which later became subject to START I agreements. They could still be inspected regularly by short-notice inspections which lasted up to May 2001.

3.6 INF Short-notice Inspections

INF short-notice inspections at MOBs and missile support facilities (excluding missile production and elimination facilities) could be made “anytime, anywhere.” The purpose of such non-scheduled monitoring was so that the state parties could ascertain that each side was abiding by the Treaty obligations. The Treaty laid down that short-notice inspections could begin 90 days after it came into force—i. e. on August 30, 1988—and that this arrangement would last for 13 years, up to May 31, 2001. Each state party had an annual inspection quota: 20 short-notice inspections during the first three years (up to May 31, 1991); 15 during the subsequent five years; and 10 for the five years after that.

Short-notice inspections had to be notified no less than 16 hours prior to the arrival of the 10-person inspection team at the POE. There, the inspection team had to specify the inspection site they were intending to visit within 4 to 24 hours of their arrival. The inspected party then had the obligation to transport the

108 The MoU of November 1, 1987, still contained 133 Soviet INF bases and facilities some of which were collocated. They were subsequently reduced to 130 sites by the update of July 1, 1988.

inspection team to the selected site within nine hours. The inspection would last for 24 hours, which could be exceeded by a maximum of eight hours if both team chiefs agreed on it. Inspection results had to be certified in inspection reports. After May 31, 1991, the only purpose of short notice inspections was to confirm that former INF MOBs and support facilities were indeed closed and that no new INF-related activities had been resumed there.

Short-notice inspections began during the elimination period that started in September 1988, but, as some former Soviet INF SS-20 MOBs were converted to operating bases for SS-25 ICBMs, such sites were of particular interest to U.S. inspection teams *after* the end of the elimination period. Distinguishing SS-20 and SS-25 missiles, which had outwardly similar stages, required special verification techniques. As the SS-25 carried one warhead while the SS-20 had carried three, one particular measurement was to gauge the differences in radiation the two types of missile emitted. Radiation detection equipment had been agreed in the Memorandum of Agreement of December 1989. Random sampling by visual observation of the interiors of one-launch canisters was used to strengthen verification.

Since many short-notice inspections were made to former missile bases in Europe, the verification agencies of the basing countries there continued to be involved in escorting Russian or U.S. inspections right up to May 2001. After Germany's unification on October 3, 1990, the German verification agency had to escort both Soviet and U.S. inspection teams, since both sides had based MOBs and support facilities on German territory. The German Armed Forces Verification Center, located in Geilenkirchen, registered a total of 74 inspections conducted in the 12 INF sites in Germany between 1989 and 1998.¹⁰⁹ The bulk of these were carried out between the summer of 1989 and May 1991. Subsequently, eleven of these sites were converted to civilian uses. When the INF verification regime ceased to exist on May 31, 2001, an illustrated volume was distributed to the INF state parties documenting what former INF sites in Germany had been turned into.

Throughout its existence between 1988 and 2001 the short-notice on-site inspection regime proved to be a valuable, additional and lasting tool for monitoring compliance with the INF Treaty. It complemented—and outlived—baseline, elimination, and close-out inspections. During the time of its implementation no major problems were recorded.

109 Zentrum für Verifikationsaufgaben der Bundeswehr, Jahresbericht Implementierung von Rüstungskontrollabkommen durch die Bundeswehr im Jahre 2001, BMVg FüS III 5, Berlin, July 2, 2002, p. 45.

4. Conclusions

In the three years from when the INF Treaty came into force—the years beginning in June 1988 and ending in May 1991—the United States and the Soviet Union eliminated a whole class of land-based, nuclear-capable intermediate-, medium- and shorter-range missiles and launchers, along with their support equipment and structures in accordance with the Treaty's provisions. They destroyed a total of 2,692 missiles, 1,114 launchers, and 7,771 other pieces of equipment that were prohibited by the Treaty and eliminated 161 missile operating bases and support facilities in the United States, the Soviet Union, Belgium, Czechoslovakia, Germany, Italy, the Netherlands and the UK.

This process was verified by more than 630 on-site inspections of five different types, including the stationing of resident inspection teams tasked with continuous monitoring of the periphery and portals of missile production plants. Verification was complemented by “cooperative measures” that permitted the use of National Technical Means of verification, managed without interference or concealment. Thousands of information details and notifications were exchanged through the Nuclear Risk Reduction Centers of both sides and several thousand inspectors, escorts, staff and aircrews were involved in the process along with the military and civilian personnel who operated the missile bases, and support and elimination facilities. Special new arms control agencies were set up, and existing risk reduction organizations expanded.

The INF elimination and verification process was unprecedented in peacetime history up to that point. The successful implementation of rather complex elimination and verification provisions, hitherto conceptualized only in studies and at the negotiation table, proved that such rules were feasible and viable in practice. They provided a cooperative control mechanism by which the opposing sides could assure each other of compliance with Treaty provisions to a very high degree of reliability. Thus, the implementation of the INF Treaty marked a turning point, shifting the superpowers' stances from confrontation to security cooperation. This shift constituted a crucial milestone on the way to ending the Cold War. Implementation of the Treaty demonstrated the intent and political resolve of governments to solve security problems cooperatively, and to reduce offensive military capabilities on the basis of parity of remaining armaments rather than on parity of reductions. In this way, the INF Treaty laid the groundwork for further arms control treaties. In particular, it was the precedent on which the reduction and verification provisions of the bilateral START Treaty (including its Periphery and Portal Control System) were built; and, then again, it lay behind those of the multilateral CFE Treaty. In consequence, regular information exchanges and notifications, on-site inspections, observation of large military exercises, and observation flights became a weekly routine.

Based on the “Presidential Initiatives” of 1991/92 the United States and the Soviet Union/Russian Federation carried out large-scale reductions of “tactical

nuclear weapons” (TNW) and withdrew them from European basing countries without legally binding treaties. By October 17, 1991, the United States had reduced its TNW in Europe from a peak of 7,400 amassed during the Cold War to a remaining figure of 400 to 600 gravity bombs.¹¹⁰ All ground-launched short-range missiles with ranges below 500 km and nuclear artillery shells were withdrawn and destroyed. Similarly, the Russian Federation withdrew TNW from basing countries and former Soviet Republics, destroying a large portion and keeping the remainder in centralized storage sites. These processes were completed in the summer of 1992.

The European basing countries eliminated their national SRBMs too. The last German Pershing IA missile was decommissioned on October 4, 1990—just one day after Germany’s unification and only a few days after the last U.S. INF missile had left Europe. The last of the 24 former GDR SS-23 was destroyed on November 14, 1991. The remaining SS-23 of the Czech Republic were destroyed in 1996, those of Slovakia in October 2000, and those of Bulgaria in October 2002.¹¹¹

After the dissolution of the Soviet Union in December 1991, the INF Treaty became a multilateral agreement to include the USSR’s successor states—the Russian Federation, Belarus, Kazakhstan, Turkmenistan, Ukraine and Uzbekistan—as INF bases and support facilities had been stationed on their territories.¹¹² The former Soviet Republics agreed to continue the INF on-site inspection regime. With the consent of the other parties, however, Turkmenistan and Uzbekistan did not take part in the meetings of the Special Verification Commission (SVC). On November 31, 1994, representatives of the United States, Russia, Belarus, Kazakhstan and Ukraine signed a formal agreement to continue implementing the INF Treaty.¹¹³

The on-site inspection regime of the INF Treaty ended on May 31, 2001. After that date, parties could still convene the SVC, but they had no verification tools other than National Technical Means (NTM). While early official assessments in the United States were confident that U.S. intelligence was in a position to cope with that task,¹¹⁴ other assessments stressed that information gained by intelligence sources needed to be analyzed and judged in accordance with the pre-

110 FAS Weapons of Mass Destruction, Intermediate-Range Nuclear Forces (INF) Chronology.

111 Ibid; see also Daryl Kimball and Kingston Reif, *The Intermediate-Range Nuclear Forces (INF) Treaty at a Glance*, <https://www.armscontrol.org>.

112 The Baltic States were not considered to be “successor states” of the Soviet Union and, therefore, did not become state parties to the INF Treaty although several INF sites had been based on their territories.

113 Daryl Kimball, Kingston Reif. Arms Control Association. *U.S.–Russian Nuclear Arms Control Agreements at a Glance. Fact Sheets&Briefs* (updated February 2019), p. 4, <https://www.armscontrol.org>.

114 United States Information Service. Press Section: Document Defense Policy. Senate Committee Finds INF Verification Feasible (Text: Boren report summary on verification), March 23, 1988, Embassy of the United States, Stockholm (EUR-207, 03/22/88).

vailing political climate.¹¹⁵ After 2014, when the United States and Russia began to accuse each other of Treaty violations, there was no cooperatively acquired database for clarification of ambiguities. The powers were unable to revive either a suitable verification regime or a new Memorandum of Agreement capable of defining criteria for new systems permitted by the Treaty while others remained banned. On August 2, 2019, the United States formally withdrew from the INF Treaty. The Russian Federation followed suit and the Treaty ceased to exist.

115 Amy F. Woolf, *Monitoring and Verification in Arms Control*. Congressional Research Service CRS Report for Congress 7-5700, December 23, 2011, p. 5, 8, <https://fas.org/sgp/crs/nuke/R41201.pdf>.