



International Symposium on Land and River Boundaries Demarcation and Maintenance in Support of Borderland Development

Land and River Boundaries Demarcation and Maintenance – Malaysia's Experience

by

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MALAYSIA

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Introduction



Geographical Location

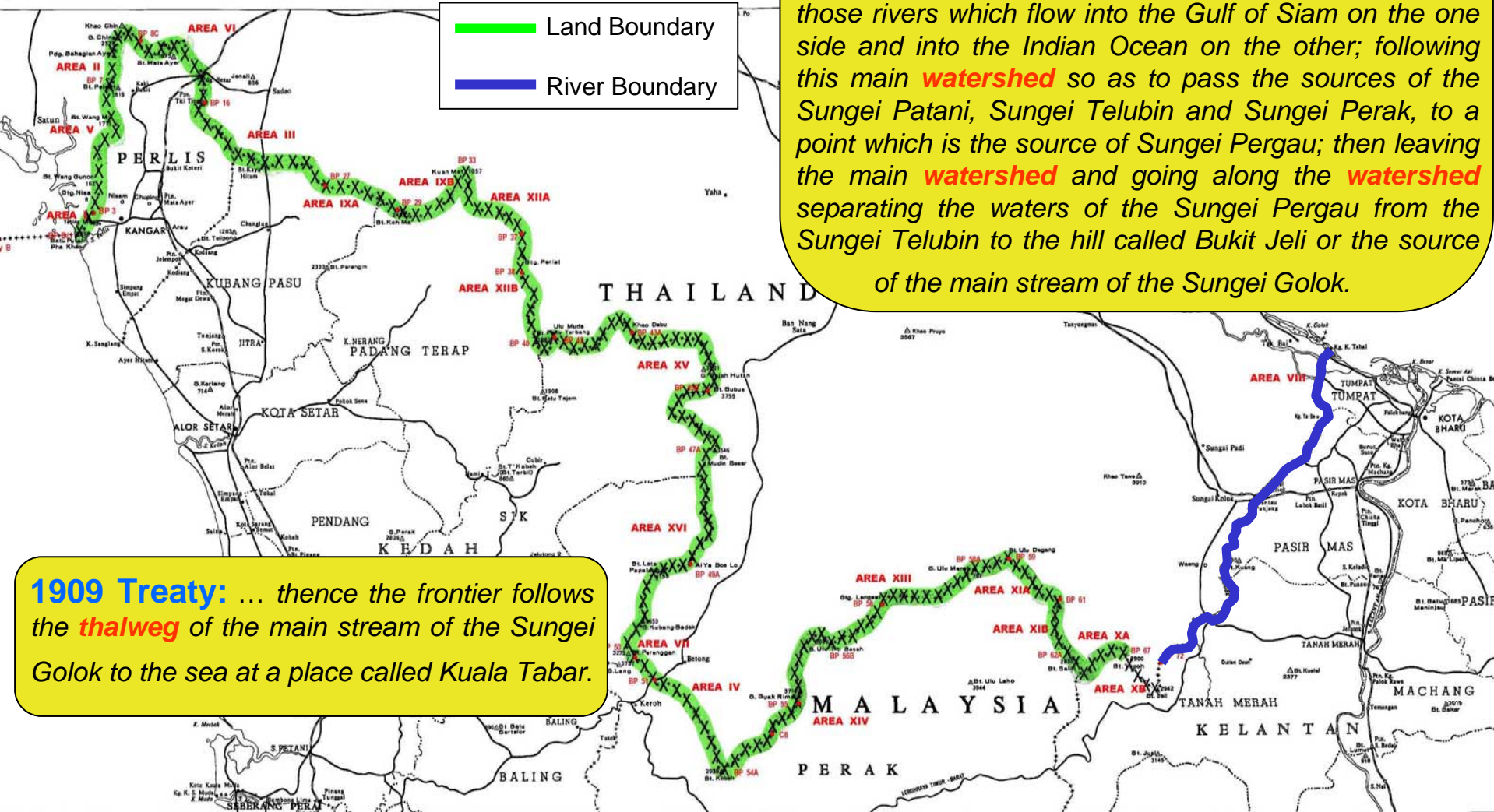


Outline of Presentation

- **Legal Aspects**
- **Organizational Aspects**
- **Technical Aspects**
- **Issues and Challenges**
- **Conclusion**

Malaysia - Thailand

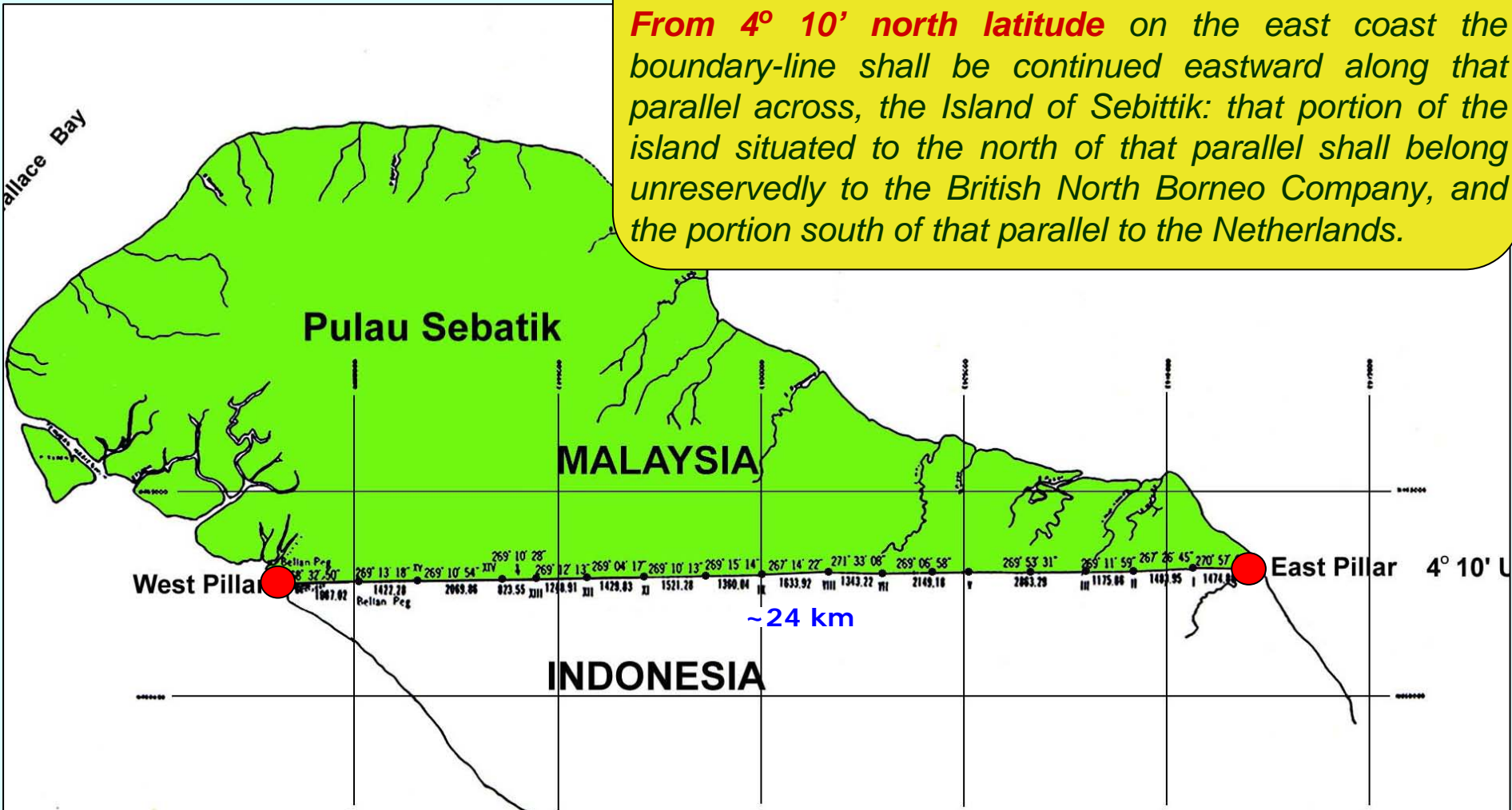
1909 Treaty: Commencing from the most seaward point of the northern bank of the estuary of the Perlis River and thence north to the range of hills which is the **watershed** between the Perlis River on the one side and the Pujoh River on the other; then following the **watershed** formed by the said range of hills until it reaches the main **watershed** or dividing line between those rivers which flow into the Gulf of Siam on the one side and into the Indian Ocean on the other; following this main **watershed** so as to pass the sources of the Sungei Patani, Sungei Telubin and Sungei Perak, to a point which is the source of Sungei Pergau; then leaving the main **watershed** and going along the **watershed** separating the waters of the Sungei Pergau from the Sungei Telubin to the hill called Bukit Jeli or the source of the main stream of the Sungei Golok.



Legal Aspects

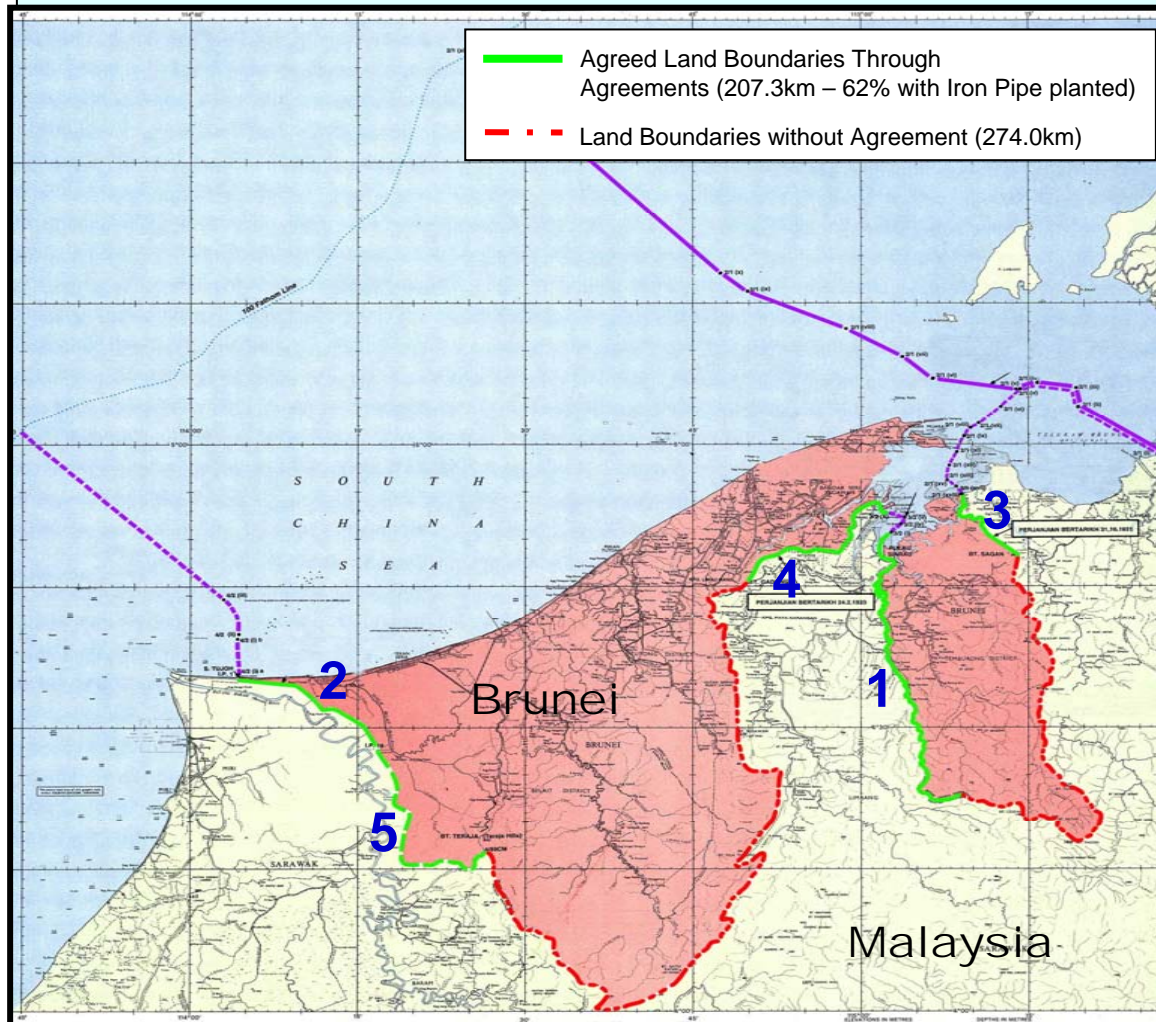
1891 BOUNDARY CONVENTION (ARTICLE IV)

From 4° 10' north latitude on the east coast the boundary-line shall be continued eastward along that parallel across, the Island of Sebitik: that portion of the island situated to the north of that parallel shall belong unreservedly to the British North Borneo Company, and the portion south of that parallel to the Netherlands.



Malaysia - Brunei

- 1.** Agreement between the Government of Brunei and the Government of Sarawak relating to the Pandaruan River and District signed by G.E. Cator (British Resident Brunei) and H.S.B. Johnson (Resident Fifth Division, Sarawak) dated the 4th of February, 1920, covering a distance of 78.0 km.
- 2.** Agreement between the Government of Brunei and the Government of Sarawak regarding the boundary between the States of Brunei and Sarawak, between the Belait and the Baram rivers from the sea coast to the Pagalayan Canal, signed by the British Resident, Brunei and H.D. Aplin (Resident, Fourth Division, Sarawak) dated the 25th of August, 1931, covering a distance of 29.7 km.
- 3.** Agreement between the Government of Brunei and the Government of Sarawak regarding the boundary between the States of Brunei and Sarawak, between Trusan and Temburong from the Coast to Bukit Sagan, signed by the British Resident, Brunei and the Resident, Fifth Division, Sarawak dated the 31st of October, 1931, covering a distance of 19.0 km.
- 4.** Agreement between the Government of Brunei and the Government of Sarawak regarding the boundary between the States of Brunei and Sarawak, between Limbang and Brunei from the Coast to a point west of Bukit Gadong, signed by the British Resident, Brunei and the Resident, Fifth Division, Sarawak dated the 24th of February, 1933, covering a distance of 37.0 km.
- 5.** Agreement regarding the boundary between the State of Brunei and the State of Sarawak from the Pagalayan Canal to the Teraja Hills, signed by the British Resident, Brunei and the Resident, Fourth division, Sarawak, dated the 4th of November, 1939, covering a distance of 43.6 km.



Memorandum of Understanding (MOU)

- ❖ Contents / Elements:
 - ☑ Organization of Joint Committees
 - ☑ Establishment of Priority Areas
 - ☑ Survey Procedures
 - ☑ Phasing of Operations
 - ☑ Finance
 - ☑ Security arrangements
 - ☑ Logistics and communication
 - ☑ Immigration and customs clearance
 - ☑ Etc.



Organisational Aspects

Malaysia - Thailand

- MOU signed on 8 September 1972 for the purpose of undertaking the joint demarcation and survey of the international boundary, involving:

| Type | Length | Priority Areas |
|----------------|----------|----------------|
| Land boundary | 551.5 km | Nineteen (19) |
| River boundary | 95.0 km | Four (4) |

Malaysia - Indonesia

- MOU signed on 26 November 1973 for the purpose of undertaking the joint demarcation and survey of the international boundary, involving:

| Type | Length | Priority Area |
|---------------|---------|---------------|
| Land boundary | 2020 km | Nineteen (19) |

Joint Committees

- Established to oversee appropriate tasks being carried out successfully, with clear terms & scope of responsibilities

Joint Committees

- ❖ Land Boundary Committee
- ❖ Technical Committee
- ❖ Co-Project Director

Chairman (Malaysian side)

- Secretary General
Ministry of Natural Resources
and Environment (NRE)
- Director General
Dept. of Survey and Mapping
- Director of Topography
Dept. of Survey and Mapping



Organisational Aspects

Joint Committees

● Malaysia - Thailand

- Joint Malaysia - Thailand Land Boundary Committee
- Joint Technical Committee on the Joint Malaysia - Thailand Land Boundary Demarcation and Survey
- Co-Project Directors on the Joint Malaysia - Thailand Land Boundary Demarcation and Survey

● Malaysia - Indonesia

- Joint Malaysia - Indonesia Boundary Committee
- Joint Malaysia - Indonesia Boundary Technical Committee
- Co-Project Directors for Sabah - Kalimantan Timur
- Co-Project Directors for Sarawak - Kalimantan Barat

Sub-Committees / Working Groups

Established from time to time, when there is a need to address specific issues or undertake joint projects for the benefit of both countries

- Joint Sub-Committee on Terms of Reference (TOR) for the Construction and Maintenance of a Single Barrier along the Malaysia - Thailand International Boundary
- Joint Working Group for the Common Border Datum Reference Frame (CBDRF) and Joint Border Mapping between Malaysia and Indonesia



Organisational Aspects

Malaysia – Thailand / Indonesia

- Joint Survey Team:

- Joint Survey Teams established to conduct the various type of surveys

Composition of Joint Survey Team
(from each country)

| | | |
|-----------------------|---|-----------|
| Team Leader | - | 1 |
| Assistant Team Leader | - | 1 |
| Observers | - | 2 |
| Bookers and Plotters | - | 2 |
| Labourers | - | <u>14</u> |
| Total | | 20 |



Organisational Aspects

Malaysia - Thailand

Joint Land Survey Teams:

Two (2) Joint Survey Teams established from both sides to conduct the various type of surveys

| | | |
|---------------------------------|---|-----------|
| Team Leader | - | 1 |
| Assistant Team Leader | - | 1 |
| Traverse and levelling officers | - | 4 |
| Reconnaissance survey officers | - | 2 |
| Plotters and Recorders | - | 2 |
| Communication operator | - | 1 |
| Drivers | - | 1 |
| Labourers | - | <u>18</u> |
| Total | | 30 |

Joint Hydrographic Team:

One (1) Joint Hydrographic Team established from both sides to conduct the hydrographic survey in determining the deepest part of Sungai/River Golok (thalweg)

| | | |
|------------------------|---|-----------|
| Team Leader | - | 1 |
| Assistant Team Leader | - | 1 |
| Hydrographic observers | - | 6 |
| Labourers | - | <u>10</u> |
| Total | | 18 |



Organisational Aspects

Joint Demarcation and Survey of Land Boundary

- **Malaysia-Thailand:** Joint demarcation and survey of land boundary commenced on 6 July 1973 and was completed on 26 September 1985. Joint demarcation and survey of the fixed and permanent international boundary along Sungai Golok (Kolok River) commenced on 1 November 2000 and has yet to be completed.
- **Malaysia-Indonesia:** Joint demarcation and survey of land boundary commenced on 9 September 1975 and was completed on February 2000.
- **Malaysia-Brunei:** Not yet started



Organisational Aspects

Malaysia - Thailand

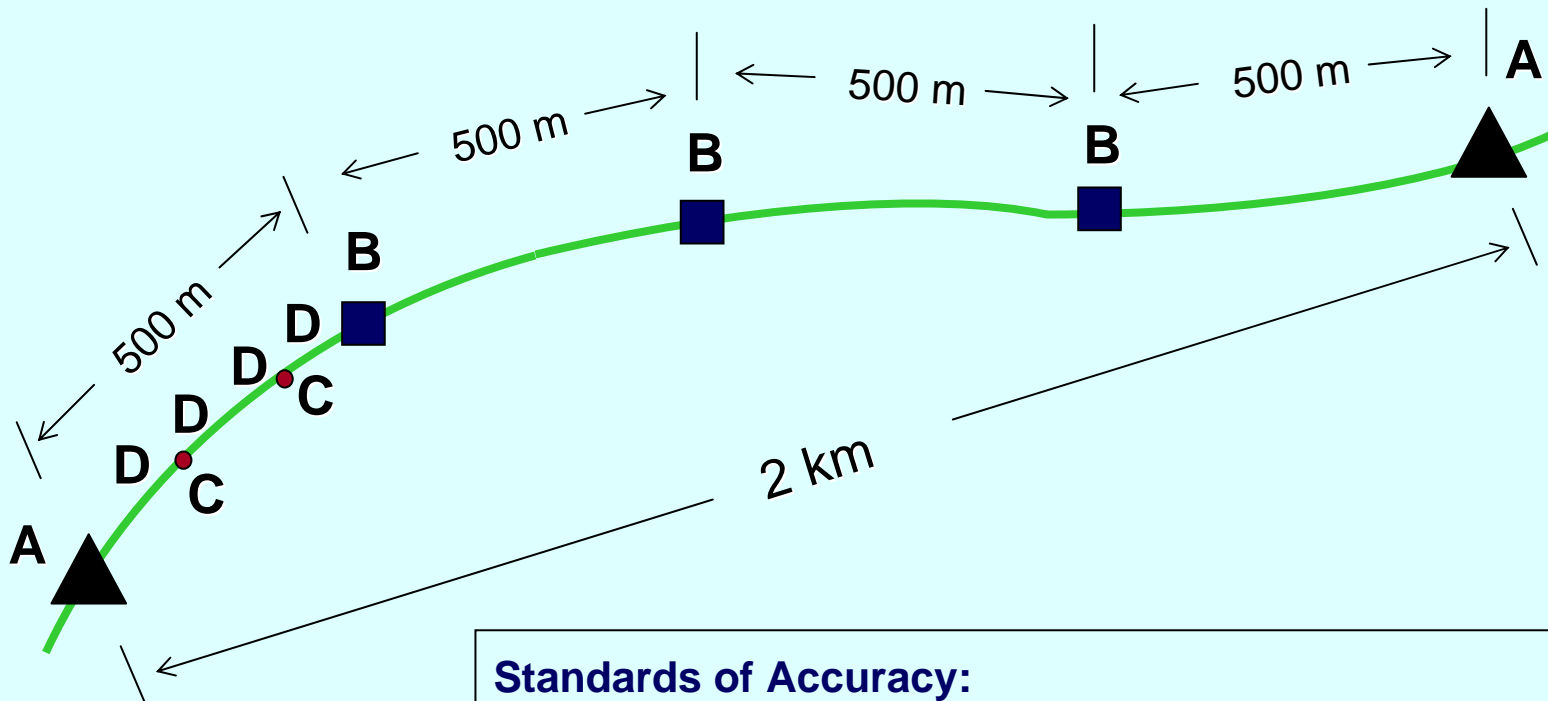
- To date, a total of eleven (11) MOU with maps attached, covering a land distance of 543 km that had been demarcated and surveyed, were signed
- The remaining land distance of 8.5 km (Bukit Jeli area) is yet to be signed due to differences of opinion on the alignment of the international boundary

Malaysia - Indonesia

- To date, a total of nineteen (19) MOU with twenty-eight (28) maps attached, covering a distance of 1822.3 km that had been demarcated and surveyed, were signed

Survey Procedures for Demarcation & Survey

Malaysia - Thailand



Standards of Accuracy:

- ❖ Angles read and finalised to nearest 0.1" and 1" respectively
- ❖ Misclose is 1.25' of arc with maximum error of $\pm 5''$ per station
- ❖ Distance measured to nearest 0.001m
- ❖ Permissible error is 1:8000

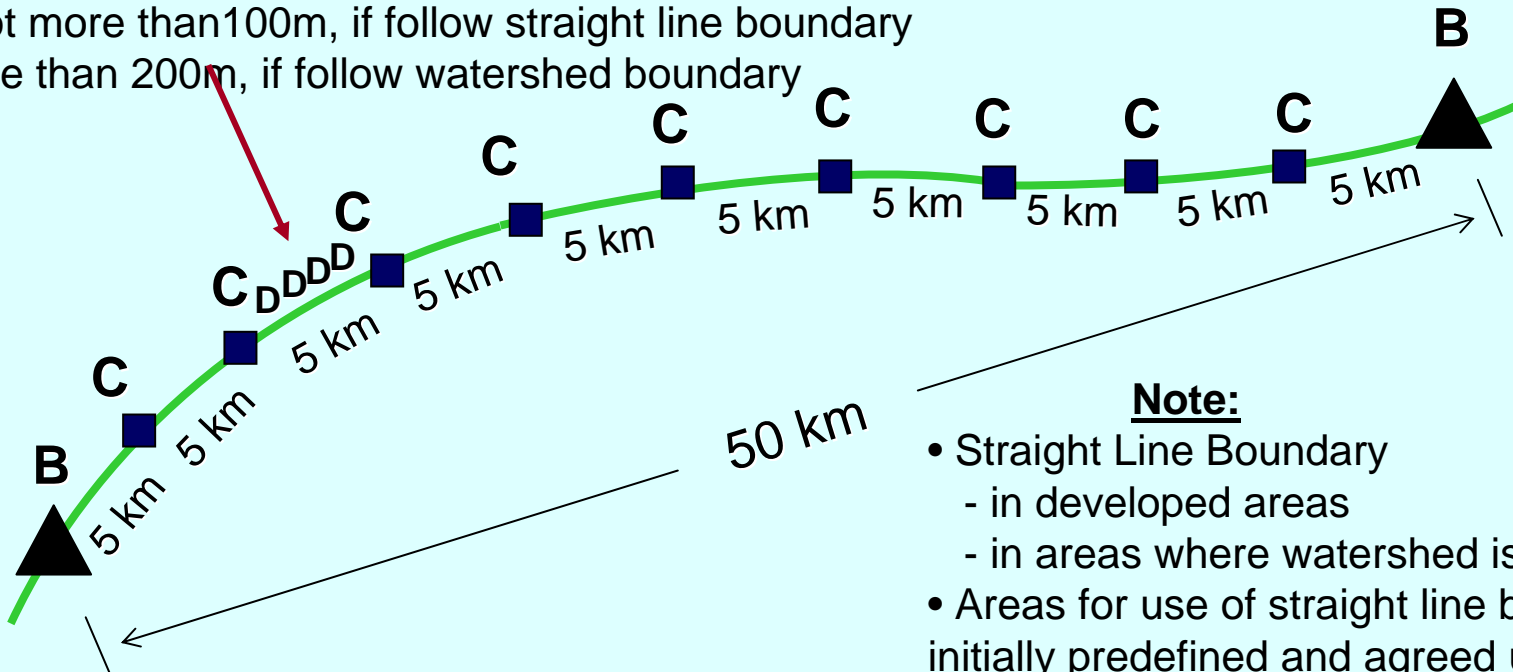
Types of Boundary Pillars / Markers (Land Boundary)



Survey Procedures for Demarcation & Survey Malaysia - Indonesia

Intervals

Type D - not more than 100m, if follow straight line boundary
or not more than 200m, if follow watershed boundary



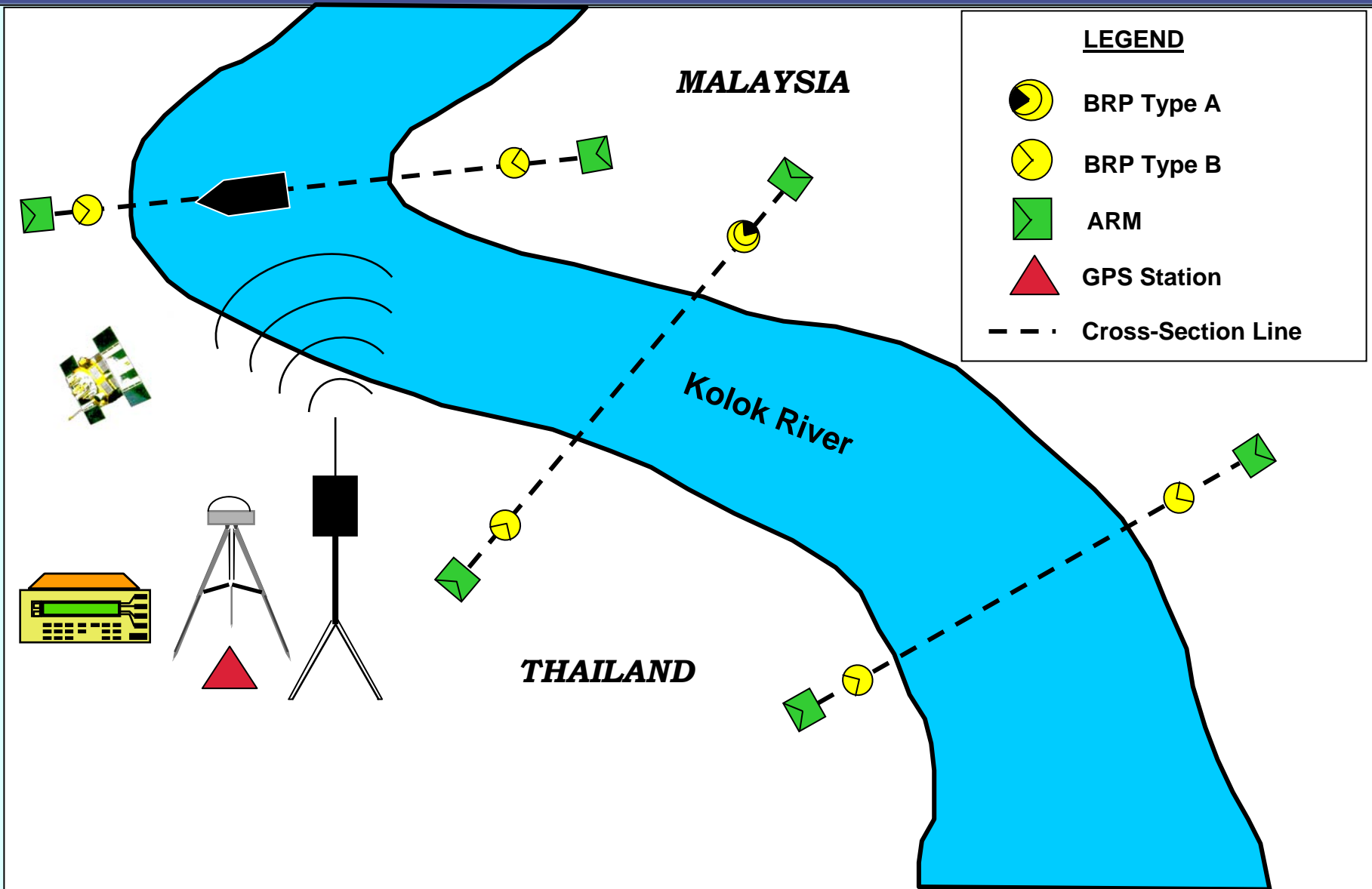
Note:

- Straight Line Boundary
 - in developed areas
 - in areas where watershed is not clear
- Areas for use of straight line boundary initially predefined and agreed upon

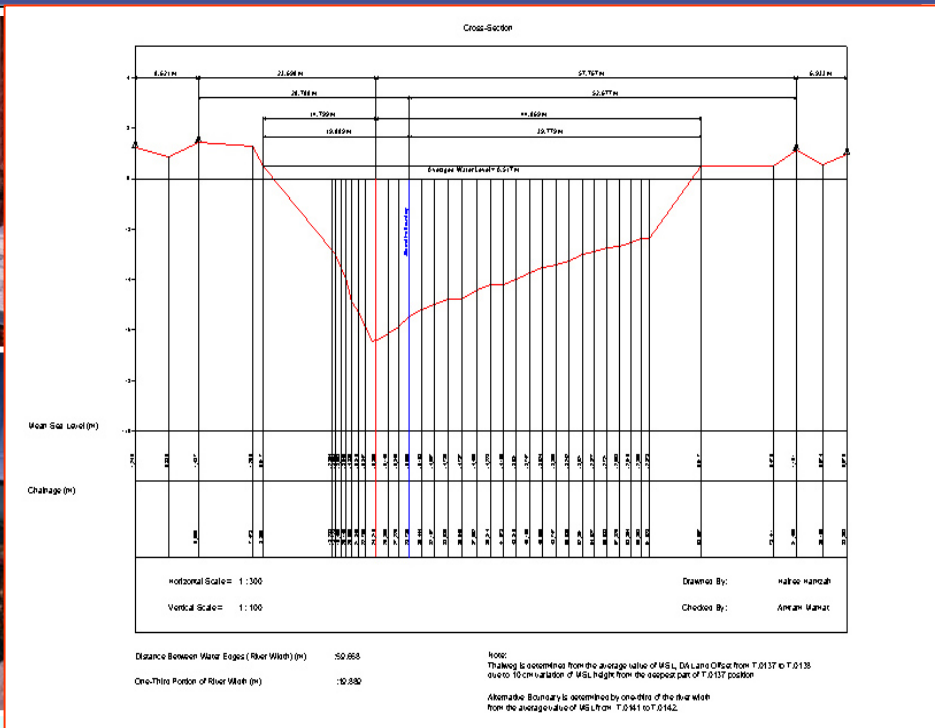
Standards of Accuracy

- Long lines (>100m) : angular misclose $\pm 75''$ at $\pm 3''$ per station, 1:15000
- Short lines (<100m): angular misclose $\pm 75''$ at $\pm 5''$ per station, 1:8000

THE DEMARCATATION AND SURVEY OF SUNGAI / RIVER GOLOK



THE DEMARCATATION AND SURVEY OF SUNGAI / RIVER GOLOK



■ Boundary

- according to thalweg positions at the time of survey
- straight lines joining the agreed thalweg points

Joint Maintenance Survey

- Follows the principle of continuous joint maintenance and care of boundary pillars and markers along the common border
 - ❖ Restoration of boundary pillars and markers which are found missing, damaged or out of position due to either man-made or natural events
 - ❖ Emplacement of additional markers at closer intervals, particularly in developed areas
- **Malaysia-Thailand:** Joint survey started on 22 October 1993 and the progress to date is about 62.8%
- **Malaysia-Indonesia:** Joint survey started on 18 August 2000 and 28 February 2004 and the progress to date is 53% and 3.4% for Sabah/Kalimantan Timur and Sarawak/Kalimantan Barat respectively

Security Situation



Booby trap incident during the Joint Demarcation and Survey of the International Boundary between Malaysia-Thailand



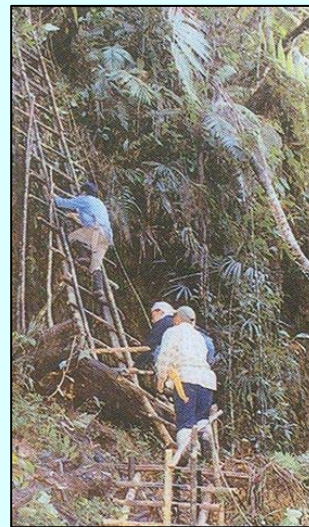
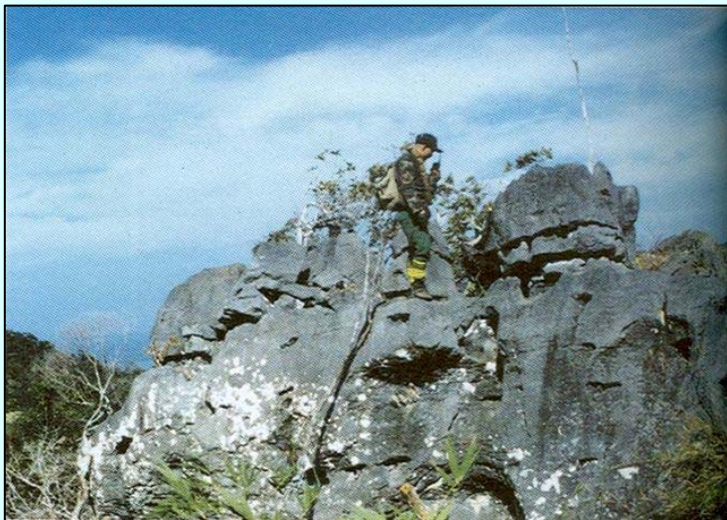
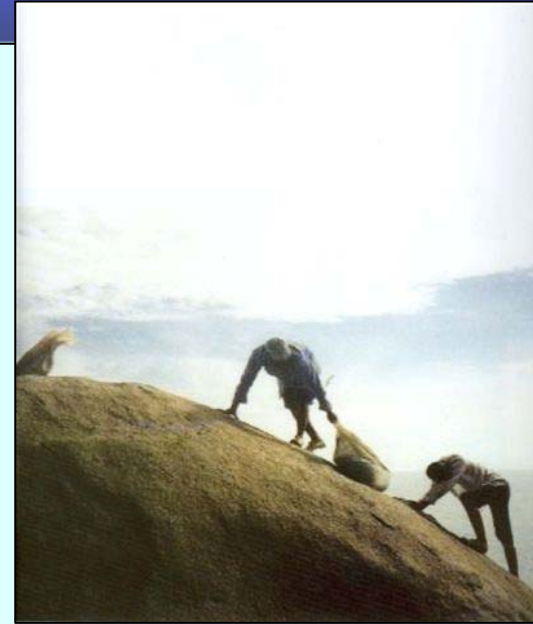
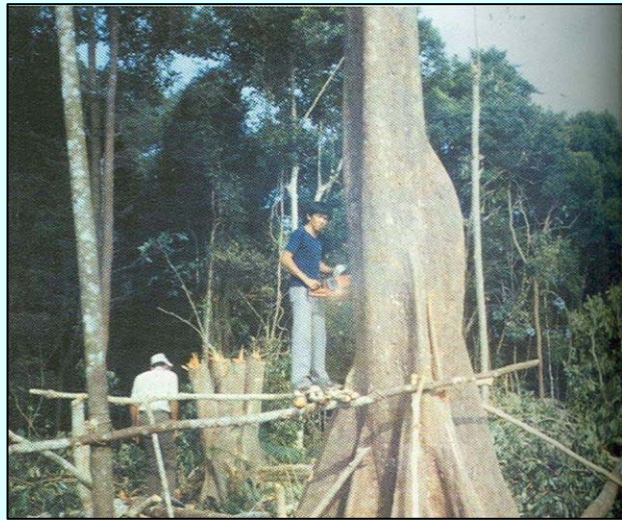
Booby Trap found and defused

Hazardous working conditions



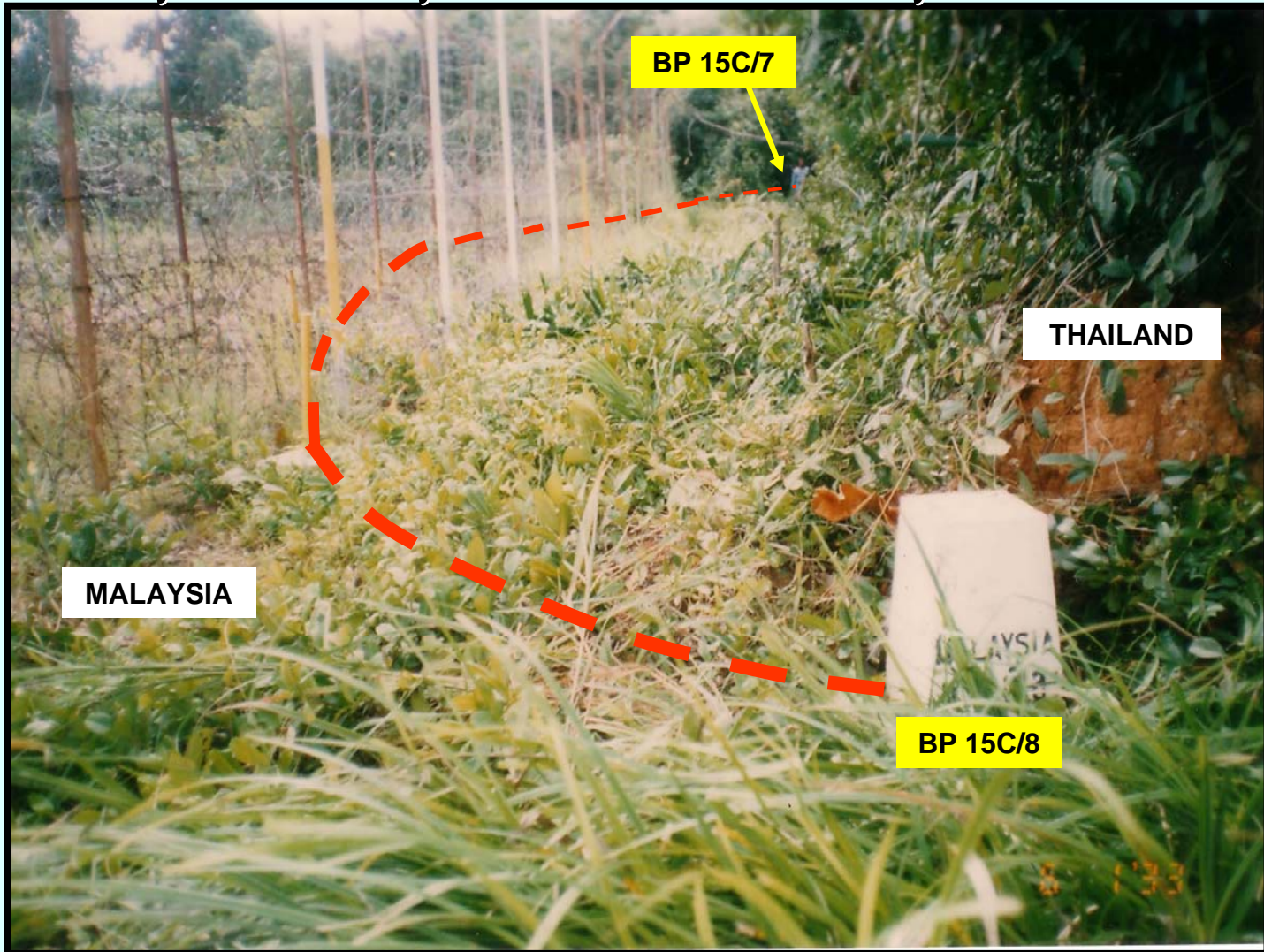
Helicopter crash during the process of logistic support for the Joint Demarcation and Survey of the International Boundary between Malaysia-Thailand

Hazardous working conditions



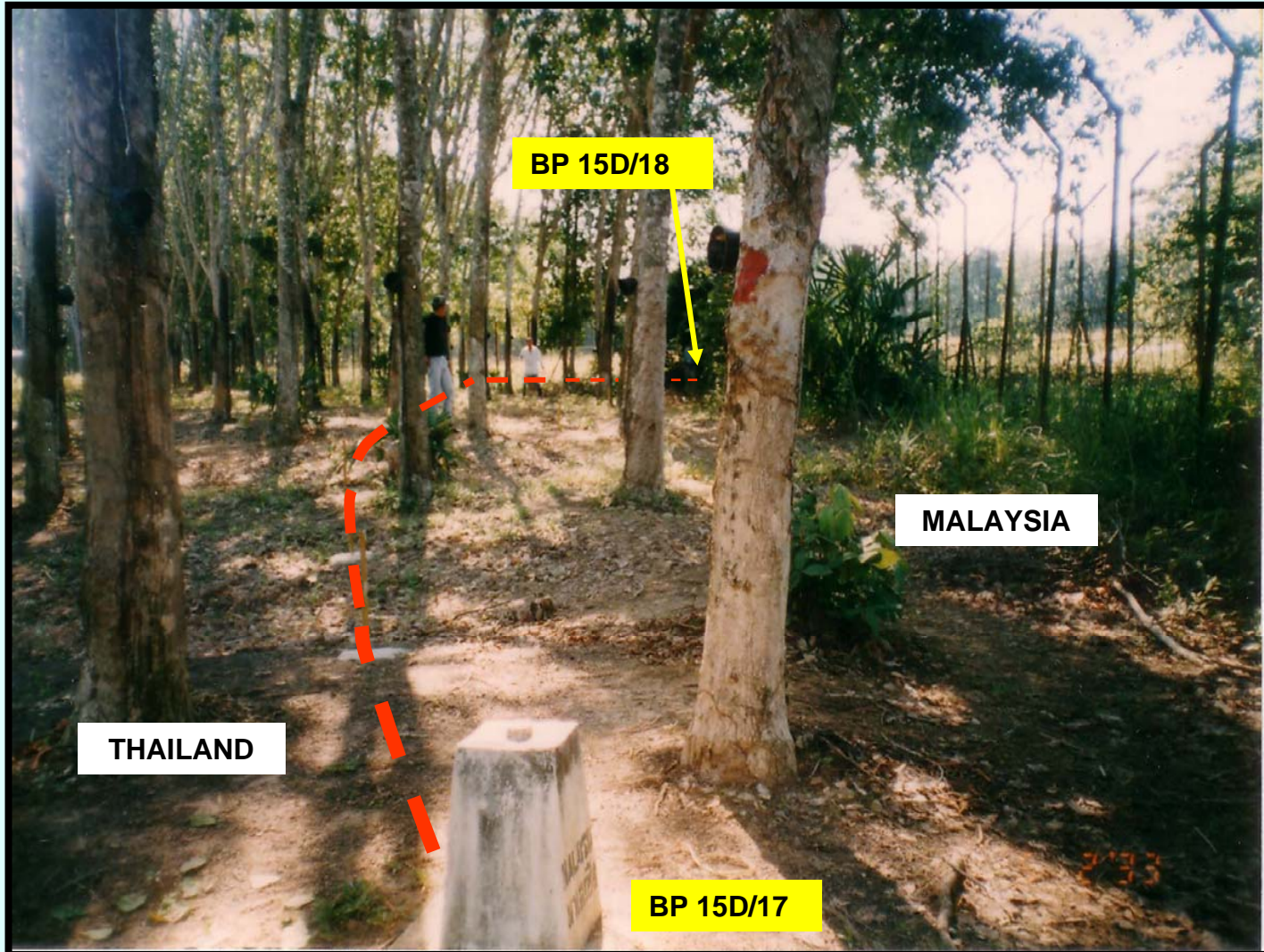
Encroachment

- Malaysian security fence into Thai territory



Encroachment

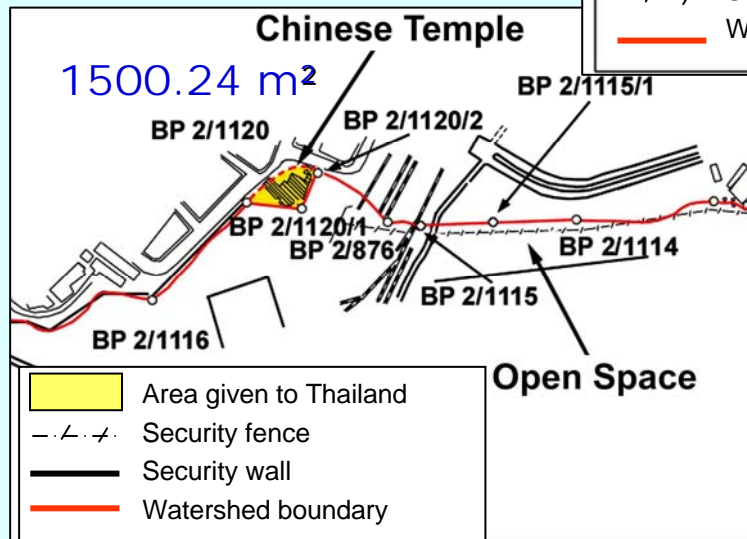
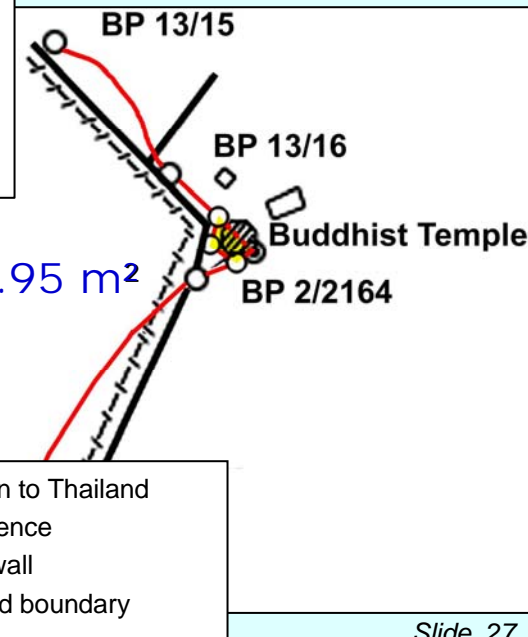
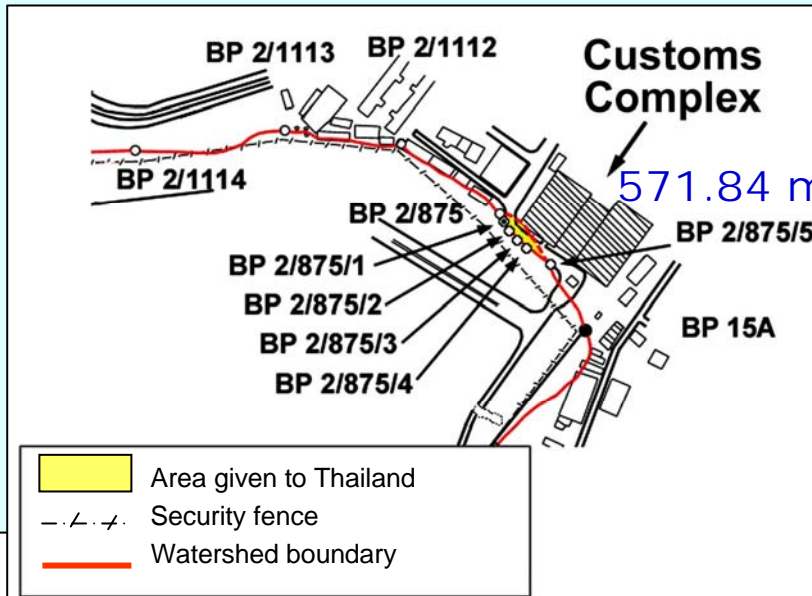
- Thai rubber estate into Malaysian side



Issues & Challenges

Encroachment

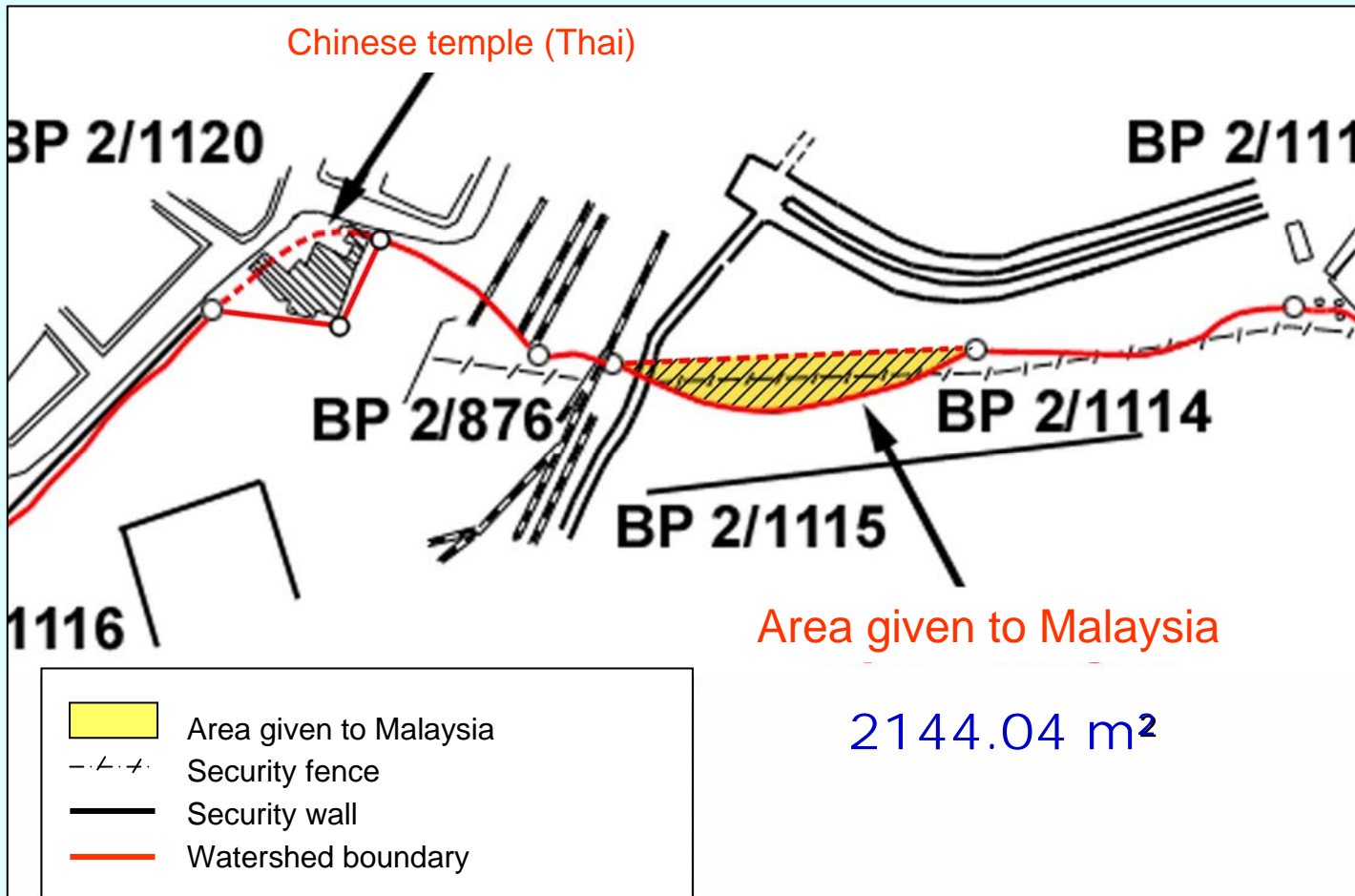
- Thai Temples and Complex into Malaysian territory



Total
2144.03 m²

Encroachment

- Solution – Exchange of equal area



Issues & Challenges

- ❖ Encroachments
- ❖ Smuggling
- ❖ Other illegal activities



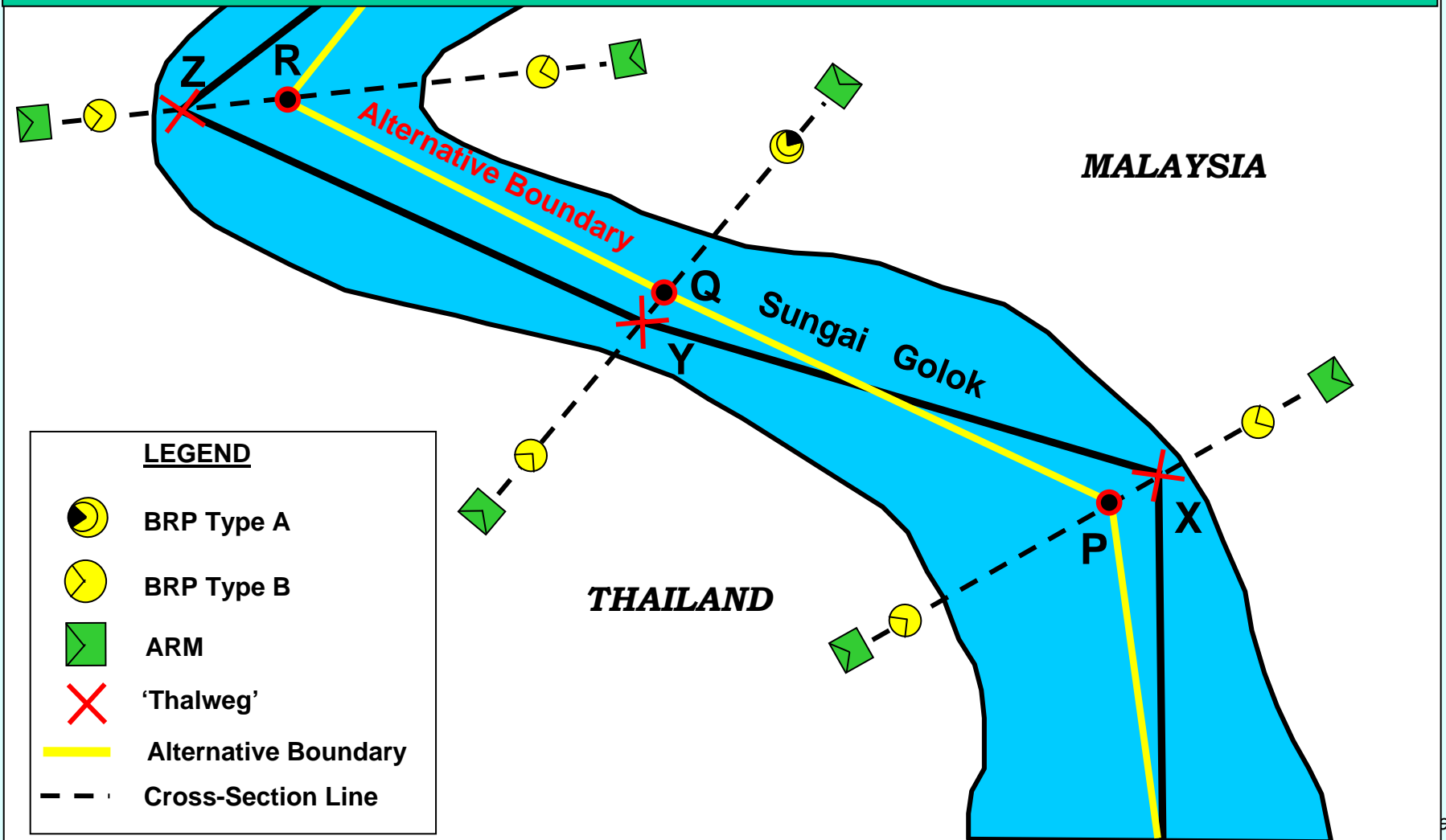
Encroachment – Malaysia / Indonesia

Use of beacon









Issues & Challenges

Use of thalweg to define river boundary



LEGEND

-  BRP Type A
-  BRP Type B
-  ARM
-  'Thalweg'
-  Alternative Boundary
-  Cross-Section Line

Conclusion

- Well-defined international boundary lines allow neighbouring countries to enjoy good relations as well as facilitate enforcement of their respective laws and regulations.
- Through the spirit of goodwill, understanding and close cooperation, Malaysia's border problems to a certain extent had been resolved amicably through negotiations.



Organisational Aspects

MOU between Malaysia-Thailand

KUALA LUMPUR MEMORANDUM OF UNDERSTANDING

1985

MEMORANDUM OF UNDERSTANDING

Pursuant to the Memorandum of Understanding relating to the joint demarcation and survey of the common land boundary between the Kingdom of Thailand and Malaysia signed at Bangkok on the 8th of September, 1972 and in accordance with the Boundary Protocol annexed to the Treaty between Great Britain and Siam signed at Bangkok on the 10th of March, 1909 the Joint Thailand-Malaysia Land Boundary Committee hereby agrees to the following:

1. The areas that have been demarcated and surveyed by the Joint Thailand-Malaysia Survey Teams are Areas XIV and XIIIB comprised in Phases I and I 2 as indicated in Map No. 10 attached hereto as Annex 1. The terminal boundary pillars/markers for the said Areas XIV and XIIIB are:

| Area | Boundary pillars/markers |
|-------|--------------------------|
| XIV | 54A to 56B |
| XIIIB | 37 to 43A |

2. The Field Plans referred to and tabulated in Annex 1 are the Field Plans which have been approved and signed, on the part of Thailand, by the Thai Co-Project Director and the Director of Survey of the Royal Thai Survey Department of Thailand, and on the part of Malaysia, by the Malaysian Co-Project Director and the Director-General of Survey and Mapping, Malaysia. These Field Plans are hereby certified to be correct.

3. All the boundary pillars/markers including the above-mentioned terminal boundary pillars/markers as demarcated and surveyed in the said Areas XIV and XIIIB are shown in the said Field Plans and their co-ordinates are listed in the table attached hereto as Annex 2.

Done in duplicate at Kuala Lumpur, Malaysia

on the 2nd day of July, 1985

For Thailand

For Malaysia

(Gen. Tan Sri Arthit Kawlayak - ek)
Supreme Commander
Royal Thai Armed Forces.
Chairman Thai National Committee.

(Detak Supakiddu Jit Bohari)
(D. S.P.N., J.M.N.)
Secretary-General Ministry of Land
and Regional Development, Malaysia.
Chairman Malaysian National Committee.



Organisational Aspects

Map attached to the MOU between Malaysia-Thailand





Technical Aspects

Survey Procedures for Demarcation & Survey

Malaysia – Thailand

- Terms of Reference and Master Plan for the Joint Demarcation and Survey of the International Boundary between Malaysia and Thailand - 1977
- Field Observation and Computation Procedures for the Joint Investigation, Refixation and Maintenance Survey - 1993
- Terms of Reference and Master Plan on the Joint Demarcation and Survey of the Fixed and Permanent International Boundary between Malaysia - Thailand along Sungai Golok (Kolok River) – 1999

Malaysia – Indonesia

- Revised Survey Procedures of 1989

Survey Procedures for Maintenance Survey

- Boundary pillars and markers are in their original positions if:
 - plumb line falls within radius of Type D markers (10.2cm),
or
 - δX and δY coordinates are within $\pm 0.05\text{m}$
 - Also when bearings and distances do not exceed $1'$ and 0.015m respectively for lines not more than 40m , and $30''$ in bearing and 0.006m per 20m with a maximum of 0.03m in length
- Accuracy of linear ratio is 1:5000 for short line traverse

Issues & Challenges

Demarcated & surveyed boundary by British-Dutch not on exact latitude



Types of Boundary Pillars / Markers (River Boundary)

BOUNDARY REFERENCE PILLAR
TYPE A



Not more than 1km
apart

BOUNDARY REFERENCE PILLAR
TYPE B



Not more than
100 metres apart

AUXILIARY REFERENCE MARKER

