

Know-How List

This is an unofficial English translation of the Japanese leaflet which is to compile what the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) has done for response and recovery after the Great East Japan Earthquake and Tsunami. It is disclosed in the MLIT website, since it might be useful for the responsible ministry in other countries to well organize the activities for response and recovery after mega-disasters.

1. Building an emergency and disaster response system

Utilizing TEC-FORCE¹

<p>Establishment of a headquarter of TEC-FORCE (Tohoku Regional Development Bureau (RDB), Secretariat of MLIT's Urgent Disaster Countermeasure Headquarter²)</p>	<ul style="list-style-type: none"> ● A headquarter for TEC-FORCE was established in the Tohoku RDB for quick deployment of TEC-FORCE members and emergency equipment brought in from around Japan. The TEC-FORCE headquarters was headed by Tohoku RDB's Director General of Planning Department and comprised of officials from the nine RDBs nationwide that which sent TEC-FORCE members. The TEC-FORCE headquarters facilitated precise support to local governments by making it possible to quickly ascertain the varied assistance needs of afflicted municipalities, coordinating TEC-FORCE dispatch with municipalities, and sharing pertinent information with the MLIT's Urgent Disaster Countermeasure Headquarter. 	1
<p>New onsite approaches tried by TEC-FORCE (Kanto RDB, Kinki RDB)</p>	<ul style="list-style-type: none"> ● The Kanto RDB dispatched full-time personnel to onsite locations to actively collect local information. As a result, the latest information was continually provided to the emergency response HQ and used in emergency response HQ operation. 	2

¹ TEC-FORCE:

TEC-FORCE is established through assigning MLIT's officials as the member of TEC-FORCE. Once a large-scale natural disaster occurs, the members of TEC-FORCE are mobilized to review and assess the status of damage, the support the municipalities in afflicted areas, and to promptly carry out technical support aiming at early recovery of afflicted areas.

² MLIT's Urgent Disaster Countermeasure Headquarter:

If a notably unusual and large-scale extraordinary disaster occurs, MLIT shall exercise the authority to establish, within the MLIT, the Headquarters for Emergency Disaster Control, when its establishment shall be regarded as particularly necessary so as to implement emergency disaster control measures against such a disaster.

	<ul style="list-style-type: none"> ● Self-contained support was achieved by having TEC-FORCE teams carry many supplies and materials. ● Mobility was secured by providing cars (with drivers) to each dispatched TEC-FORCE team. ● Assigning support personnel (logistics teams) to local TEC-FORCE teams facilitated flexible responses to changing situations by the hour. 	
Enhancement of support for TEC-FORCE (Kinki RDB, Kyusyu RDB)	<ul style="list-style-type: none"> ● The Kinki RDB prepared a list of available replacement personnel in advance, which contributed to smooth arrangement of personnel over the long term. ● Daily meetings were held at support response headquarters set up at dispatch locations. The meetings' proceedings were streamed via a TV conference system to all offices. Local team leaders and members also participated in meetings via teleconferencing or mobile telephones. They were effective in quickly ascertaining members' health status and local conditions/needs and smoothly executing support activities. 	3
Application of TEC-FORCE activity plans and activity bases (Tohoku RDB)	<ul style="list-style-type: none"> ● Smooth dispatches and activities were made possible by surveying staging areas and activity bases and preparing activity plans for the large numbers of TEC-FORCE members and emergency equipment to be brought in from around Japan. 	4

Establishing a concentrated response system in collaboration with other organizations

Collaboration between the US military and the Self-Defense Force (SDF) at Sendai Airport (Civil Aviation Bureau)	<ul style="list-style-type: none"> ● Immediately after the disaster, the Civil Aviation Bureau received an offer from the US military, made through the Ministry of Defense, involving support for the removal of wreckage from Sendai Airport and then subsequent use of rescue aircraft (later called "Operation Tomodachi"). The Civil Aviation Bureau and Ministry of Defense immediately set about forming a consensus concerning this offer and established a place for coordination and discussion among the US military, SDF, and airport personnel within a local airport office. This facilitated smooth coordination with the US military and SDF and the early transport of many relief supplies using Sendai 	5
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	<p>Airport. It also led to the smooth clearing of wreckage in the airport, which brought the early restoration of civilian aircraft service. *A total of 87 US military aircraft transported emergency supplies to Sendai Airport between March 18 and April 3.</p>	
<p>Collaboration with the SDF in road clearing work (Road Bureau)</p>	<ul style="list-style-type: none"> As part of work to temporarily restore bridges that had been washed away by the tsunami, the SDF constructed a temporary bridge for the collapsed Mizushiri Bridge on National Route 45 (Minamisanriku Town, Miyagi Prefecture) that allowed passage of this point at an the early stage of response. 	6
<p>Emergency drainage by establishing a drainage project team (Water and Disaster Management Bureau)</p>	<ul style="list-style-type: none"> As large-scale inundation caused by the tsunami hampered search activities and facility reconstruction, the Water and Disaster Management Bureau established a project team to conduct emergency drainage work where required, regardless of jurisdiction. By coordinating with MLIT's project team (established by the Water and Disaster Bureau) and local project team (established by the River Department of Tohoku RDB), drainage pump vehicles were mobilized from several RDBs throughout Japan (a total of 96 vehicles operated during the peak) and executed emergency drainage work in an agile and focused manner. This effort helped resolve the inundation problem. 	7
<p>Emergency drainage work in response to local circumstances (Tohoku RDB)</p>	<ul style="list-style-type: none"> The Tohoku RDB held discussions with concerned organizations, prepared effective drainage plans based on local circumstances, and executed emergency drainage work to support regional restoration and searches for missing people in districts that suffered widespread flooding due to tsunami-destroyed river levees. It concentrated drainage pump vehicles at Sendai Airport, which had been flooded by the tsunami, and lowered the flood depth there by conducting emergency drainage work, thereby contributing to the airport's early restoration. 	8
<p>Securing vessels for use in emergency transport (Maritime Bureau)</p>	<ul style="list-style-type: none"> The bureau secured vessels capable of delivering relief supplies to afflicted regions in response to requests from a "Tohoku-Pacific Ocean Earthquake disaster management 	9

	headquarters” that was established within Japan Federation of Coastal Shipping Associations (March 11, 2011). (10 roll on/roll off ships , 4-5 container ships , 3 gravel carriers)	
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Safety management of government buildings and personnel

Dispatch of personnel to investigate the damage of afflicted buildings (Government Buildings Department, Minister’s Secretariat)	<ul style="list-style-type: none"> ● Confirming the safety of buildings is important from the standpoint of protecting human life and business continuity, and should be executed as soon as possible. Department staff with knowledge of building technologies provided technical advice to facility managers. 	10
Notifications of points to note when using government buildings to various ministries and agencies and provision of technical assistance (Government Buildings Department, Minister’s Secretariat)	<ul style="list-style-type: none"> ● The department issued the following notifications: <ul style="list-style-type: none"> · Points to note regarding the equipment of disaster-damaged buildings · Regarding thorough execution of energy-conservation measures at government buildings confronted with planned power outages · Points for facility managers to note before and after planned power outages · Regarding implementation of emergency inspections of buildings with seismically isolated structures · Points to note when using disaster-damaged facilities 	11

Building an efficient system for helicopter operations

Pre-disaster identification of heliports (Secretariat of MLIT’s Urgent Disaster Countermeasure Headquarter)	<ul style="list-style-type: none"> ● Pre-disaster identification of jurisdictional heliports and takeoff/landing facilities that are outside of emergency sites facilitated quick decision-making regarding flight routes in damage surveys and onsite observations conducted by MLIT disaster-response helicopters, which in turn led to early ascertainment of damage conditions. 	12
Helicopter operations (division of survey areas) (Secretariat of MLIT’s Urgent Disaster Countermeasure Headquarter)	<ul style="list-style-type: none"> ● Conducting a wide-area survey immediately after the disaster by dividing up the survey area among several MLIT disaster-response helicopters made it possible to quickly ascertain coastal flooding, inland landslides, and the conditions of road and rivers when field surveys could 	13

	not due to damaged transport infrastructure.	
Response at initial operation of disaster-response helicopters (Tohoku RDB)	<ul style="list-style-type: none"> As the tsunami warning (major tsunami) was being announced, helicopter crews began making survey flights (i.e., took off) without waiting for the arrival of bureau personnel. This made it possible to protect the helicopters from the tsunami and survey subsequent damage. <p>An additional factor was that flight instructions were able to be issued immediately via the hotline even though normal telecommunications were paralyzed.</p>	14

Securing means of communication

Establishment of an intranet site for information-sharing within the Regional Development Bureau (Tohoku RDB)	<ul style="list-style-type: none"> To facilitate information-sharing, the Tohoku RDB established a site for sharing information on the Great East Japan Earthquake within the bureau's intranet. Site contents are: press announcements, related site links, list of dispatched liaison personnel, helicopter flight plans, weather information, public transport/infrastructure information, related materials, news items, welfare-related items (information on available systems, information on open eating and drinking establishments and bathing facilities), etc. 	15
Consolidation of responses to inquiries from the public (Japan Meteorological Agency)	<ul style="list-style-type: none"> The Japan Meteorological Agency consolidated its responses to inquiries from the public with specially installed telephones in the Seismological and Volcanological Department. Personnel in the department handled calls in shifts. Materials and anticipated questions for handling calls were shared among personnel. Although the great number of calls placed a significant burden on the personnel, this step was effective in preventing the delay in duty that would have occurred if calls were handled haphazardly by various offices and persons in charge, unifying explanations given to the inquiries from the public, and grasping the content of the calls. 	16
Communication with bicycles and	<ul style="list-style-type: none"> Quick information-gathering and communication were 	17

<p>dedicated telephones (Railway Bureau)</p>	<p>successfully achieved through the following actions.</p> <ul style="list-style-type: none"> · On the day of the disaster, March 11, railway operators were overburdened with inspections and restoration work, and thus could not fully communicate with the bureau. The bureau therefore dispatched personnel to major railway operators and put them in charge of communication. · Railway Bureau personnel were dispatched to the Prime Minister's Office immediately after the disaster. · Telephone service was still extremely poor even in the Tokyo metropolitan area for several days following the disaster. Because of this, it became relatively easier to communicate with areas outside the afflicted regions by using dedicated telephone lines. The surest way of communicating with railway operators outside the afflicted regions was e-mail. 	
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2. Provision of disaster-management information

Consolidating and supplying disaster information

<p>Active supply of information to news organizations (the “mass media”) (Public Relations Division, Minister's Secretariat)</p>	<ul style="list-style-type: none"> ● While acting based on meetings of MLIT's emergency response headquarters, the division worked to collaborate with disaster public relations officers in bureaus and departments while also actively supplying information by holding briefings for/distributing materials to news organizations. (No. of emergency response HQ meetings: 48; No. of briefings: 60; No. of materials distributed: 651 [as of the end of June]) 	18
<p>Preparation and presentation of a transport restoration status chart (Road Bureau, Railway Bureau, Ports and Harbours Bureau, Civil Aviation Bureau, Geospatial Information Authority of Japan, Secretariat of MLIT's Urgent Disaster Countermeasure Headquarter)</p>	<ul style="list-style-type: none"> ● Progress in restoration of major roads, railways, airports, and ports was summarized into a single chart and made available to the public. ● The chart was posted on the MLIT website and presented by the mass media, which resulted in its being used in efficient lifesaving, relief supplies transport, and other activities. Moreover, the restoration status chart was prepared in a magnified A1-size panel that was distributed to minister's offices and the Prime Minister's Office, where it proved highly useful in explanations to visitors. 	19

Supplying specialized information in a fine-tuned manner

<p>Preparation and presentation of a sewerage damage and restoration status chart (Sewerage and Wastewater Management Department, Water and Disaster Management Bureau)</p>	<ul style="list-style-type: none"> ● The department compiled information on damage to sewerage treatment plants and their restoration status into a single chart. It further noted the status of sewer surveys as well as pertinent responses and support initiatives on the chart, and posted the chart on its website. ● Precise information supply was achieved by concisely showing sewerage damage conditions, restoration status, and initiatives in a single chart. 	20
<p>Supplying geospatial information by a geographical information support team (Geospatial Information Authority of Japan)</p>	<ul style="list-style-type: none"> ● Following the Great East Japan Earthquake, the Geospatial Information Authority of Japan (GSI) received an unprecedented number of requests for geospatial information from concerned government bodies and other organizations. In response, GSI centralized its information-supply activities by specially establishing a geographical information support team in its emergency response headquarters and assigning required staff members to it. This allowed GSI to provide geospatial information in an appropriate, efficient, and easily comprehensible manner. It supported the disaster response activities of various organizations by providing information in 1,270 instances (up to June 17). 	21
<p>Announcement of secondary disaster risk evaluations made based on airborne laser surveys, etc. (Water and Disaster Management Bureau, Geospatial Information Authority of Japan)</p>	<ul style="list-style-type: none"> ● The status of ground subsidence resulting from the earthquake was announced for the Sendai Plain, Miyagi Prefecture coast, and Iwate Prefecture coast based on airborne laser surveys that surveyed topography from aircraft, and then secondary disaster risk evaluations were conducted and made public. 	22
<p>Supply of information on bus operations (Road Transport Bureau)</p>	<ul style="list-style-type: none"> ● The bureau asked the Nihon Bus Association to quickly resume operation in order to provide substitute transport for the Tohoku Shinkansen. ● It prepared and presented a table summarizing information on the restart and new establishment of express bus services to and from the Tohoku region. It 	23

	<p>simultaneously announced transport capacity (number of operating vehicles, number of available seats, etc.).</p> <ul style="list-style-type: none"> ● It summarized bus operations to replace railway services into a single chart and presented it to the public. ● It presented a list of websites providing operational information to help users grasp the latest operational status of main local buses in the Tohoku region and other areas. ● It prepared a single map showing the operation of local buses in coastal areas of the Tohoku region's Pacific coast in terms of the pre-disaster number of routes and number of restarted routes in each prefecture and presented it to the public. 	
<p>Provision of images of the tsunami strike (Japan Coast Guard (JCG))</p>	<ul style="list-style-type: none"> ● JCG supplied images of a patrol vessel going over the tsunami that was taken by the vessel's crew, images of the tsunami inundating Sendai Airport that a Sendai Air Station employee took while evacuating to the roof of a government building, and other images to the news media. ● The showing of these images via the news media and the internet to people not only in Japan but around the world helped communicate the speed and size of the tsunami, the extent of its destruction, and the urgent situation evacuees faced when it struck. 	24

Utilizing websites

<p>Supply of information through the MLIT website and MLIT mobile website (Public Relations Division, Minister's Secretariat)</p>	<ul style="list-style-type: none"> ● By establishing a "Great East Japan Earthquake information site" on the top page of the MLIT website and consolidating disaster-related information that included the following, afflicted local governments, disaster victims, and ordinary citizens were able to get information easily. <ul style="list-style-type: none"> · Details on MLIT's response to issues concerning transport, housing, etc. · Information for people affected by the disaster and afflicted regions, etc. ● The division has set up a MLIT website for mobile phones that primarily supplies information needed by afflicted regions and disaster victims. (For mobile phones, the 	25
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	“i-mode” system operated by NTT was used to show disaster-related information.)	
Supply of disaster-management information to afflicted regions via the Japan Meteorological Agency’s website (Japan Meteorological Agency)	<ul style="list-style-type: none"> ● The Japan Meteorological Agency (JMA) established a Great East Japan Earthquake-related portal site on its website and used it to provide relevant information (e.g., weather in afflicted regions, information on earthquakes and tsunami, etc.) to persons in charge of restoration and reconstruction and disaster victims. (The portal site was used in communications to local residents [evacuation advisories from local governments, etc.], flooding countermeasures and temporary evacuations by residents of inundated areas, restoration and reconstruction work by local governments, etc.) ● JMA called attention to the possibility of earthquake-caused ground subsidence and accompanying flooding by announcing tide level information timed with spring tide periods and issuing press releases. ● It prepared a “tide level calendar” that compiles into a single list the hourly astronomical tide levels of major ports for each month and posted it on its website. 	26
Centralized announcement of road restrictions and damage information on the website of Geospatial Information Authority of Japan (Road Bureau, Geospatial Information Authority of Japan)	<ul style="list-style-type: none"> ● Centralized information on road restrictions for national roads, local roads, etc., was made public on the website of Geospatial Information Authority of Japan. 	27
Various new approaches taken on the Regional Development Bureau website (Tohoku RDB)	<ul style="list-style-type: none"> ● In order to prevent mismatches in resupply efforts, the bureau set up a temporary bulletin board on its website to provide information on resupply needs in the many municipalities that required accurate and quick information but had lost means of communication. This bulletin board remained in use until communications could be fully restored. The bulletin board was also used as a means for providing information on current conditions in afflicted municipalities. ● A portion of the bureau’s information on the Great East 	28

	<p>Japan Earthquake was posted in an English version of the website to strengthen communication with foreigners entering afflicted regions and people aboard.</p> <ul style="list-style-type: none"> ● The number of inquiries was reduced by attaching detailed maps showing the locations of evacuation centers and detours when announcing continually updated information on road restoration work. 	
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Utilizing various media

<p>Communication of disaster-management information via community FM radio stations (Japan Meteorological Agency)</p>	<ul style="list-style-type: none"> ● The Japan Meteorological Agency provided information to community FM radio stations to communicate weather warnings, tsunami warnings, and other information to residents of municipalities with damaged disaster-management radio systems and broadcasting facilities. ● This made it possible to continue providing disaster-management information to regions that lost their disaster-management radio systems or with unrepaired communications infrastructure. 	29
<p>Communication via MLIT's e-mail newsletter (Public Relations Division, Minister's Secretariat)</p>	<ul style="list-style-type: none"> ● The division established an item concerning "response to the Great East Japan Earthquake" in MLIT's e-mail newsletter. For roughly two months following the disaster, this item presented in compact form the latest on MLIT's disaster responses and initiatives. 	30
<p>Communication through collaboration with the Cabinet Public Relations Office (Public Relations Office, Government of Japan) (Public Relations Division, Minister's Secretariat)</p>	<ul style="list-style-type: none"> ● The division posted information on MLIT's responses on the "Prime Minister's Office's disaster response page." ● It provided and posted information in <i>Hisaichi Chokko Kabe-Shimbun</i> (wall newspaper sent directly to afflicted regions), <i>Seikatsu Shien Handbook</i> (livelihood support handbook), and other publications of the Cabinet Public Relations Office. ● It provided and posted information in "half-page advertisements in local Tohoku newspapers" that were put together by the Cabinet Public Relations Office. ● It provided information to <i>Shinsai Joho: Kantei-hatsu</i> (disaster information: from the Prime Minister's Office), an FM radio program by Chief Cabinet Secretary Edano. 	31

	<ul style="list-style-type: none"> ● It provided information to the Prime Minister's Office's disaster information Twitter feed managed by the Cabinet Public Relations Office. 	
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3. Measures to combat harmful rumors

Communicating accurate information to the world

<p>Supply of information through the MLIT website (English) (Public Relations Division, Minister's Secretariat)</p>	<ul style="list-style-type: none"> ● The division is reinforcing its system for diffusing information abroad with its English-language website. <ul style="list-style-type: none"> · The site "2011 Tohoku district - off the Pacific Ocean Earthquake" comprehensively described MLIT's response and provided disaster and disaster-related information (including the nuclear power plant accident). · The site "Japanese Air Transport after the 2011 Tohoku - Pacific Ocean Earthquake" provided accurate information on Japan's aviation to encourage people to fly in Japan with peace of mind. · The site "Information on Radioactivity Level (Metropolitan Airports and Ports)" described radiation measurements at ports and harbors in the Tokyo metropolitan area. 	32
<p>Communication of information to foreign visitors to Japan (Japan Tourism Agency)</p>	<ul style="list-style-type: none"> ● From the day of the disaster, the Japan Tourism Agency posted disaster-related information on the website of the Japan National Tourism Organization (JNTO) for precise communication of information to foreign visitors to Japan. Wherever possible, it provided easy-to-understand information presented from the user's standpoint. ● In particular, "Japan Now on Video" was generally well received by foreigners as a source of highly objective information. 	33
<p>Communication of accurate information to foreigners (Japan Meteorological Agency)</p>	<ul style="list-style-type: none"> ● The Japan Meteorological Agency presented information on the earthquake and tsunami in real time, regular updates of weather information for the afflicted areas (including the vicinity of the nuclear power plants) several times a day, and important disaster-management points for local areas and prospect of aftershock activity as necessary in English on its website. 	34

	<ul style="list-style-type: none"> This information was highly regarded for its contribution to the activities of international organizations, such as the International Atomic Energy Agency and the World Meteorological Organization, as well as overseas news media. 	
<p>Issuance of written confirmations of radiation measurements to Japanese-built ships by the Maritime Bureau and Nippon Kaiji Kyokai (Maritime Bureau)</p>	<ul style="list-style-type: none"> The Maritime Bureau in partnership with the Nippon Kaiji Kyokai issue certificates confirming that proper measurement methods were used in reports on radiation measurement results that were prepared by shipbuilding businesses for new ships and marine equipment made in Japan. This action was taken in response to requests from shipbuilding and ship machinery companies for such certification given concerns expressed by foreign shipowners about residual radioactive material on Japanese-built ships. 	35
<p>Announcement of air and seawater radiation measurements in ports and harbors on MLIT's website (Ports and Harbours Bureau)</p>	<ul style="list-style-type: none"> The bureau compiled air and seawater radiation measurements within Tokyo bay and ports of the afflicted regions into charts that were presented each day on the MLIT website. (For the first two months, these charts were updated twice daily. They are currently updated once daily.) Additionally, air and seawater radiation measurements for areas near ports and harbors that are under the jurisdiction of each Regional Development Bureau were gathered at each bureau and announced on its website. By notifying port managers and concerned organizations (CIQ, etc.) in other countries of these responses through diplomatic channels, the bureau demonstrated the safety of Japan's ports to the world. 	36

4. Support for transport of emergency supplies

Securing regional transport routes

<p>"Operation Comb" (Road Bureau, Tohoku RDB)</p>	<ul style="list-style-type: none"> In order to secure relief routes, the bureau joined with the prefectures and SDF to secure roads with little damage (Tohoku Expressway, National Rte 4 north-south line), set up access routes to the heavily damaged Pacific coast, and conduct intensive inspections and surveys with priority on 	37
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	<p>road clearing. These actions made early road clearing possible.</p> <ul style="list-style-type: none"> ● Regarding clearing work on National Route 45 and other coastal roads, the cooperation of local construction companies that had entered into disaster agreements from the time immediately following the disaster also contributed to early road clearance. ● Within one week of the disaster, road clearance work in the north-south direction of National Route 45 along the Pacific coast had progressed to the point that 97% of the road was passable. 	
<p>Clearing waterway (Ports and Harbours Bureau, Japan Coast Guard)</p>	<ul style="list-style-type: none"> ● In the days immediately following the disaster of March 11, waterways and basins for anchorage at 14 Major International Ports and Major Ports on the Pacific Ocean side (from Hachinohe City, Aomori Prefecture, to Ibaraki Prefecture) were made unusable by obstructions resulting from the tsunami. Work to clear these waterways and basins for anchorage began on the day after the tsunami warning (major tsunami) was canceled on March 14. Kamaishi Port and Ibaraki Port (Hitachinaka Port District) were the first to be made useable on March 15, and all 14 were reopened by March 24. The reopening of these ports supported the transport of emergency relief supplies. ● Planning and the division of roles in surveyed sea areas were determined based on coordination between the Ports and Harbours Bureau and the Japan Coast Guard. Hydrographic surveying of ship channels was quickly executed by Japan Coast Guard with help from the Maritime SDF (Ministry of Defense) in the removal of floating objects and dealing with ropes caught in survey boats' propellers. 	38
<p>Setting up a detour for transport of petroleum by railway (Railway Bureau)</p>	<ul style="list-style-type: none"> ● As petroleum could not be transported to Morioka and Koriyama Cities due to the impassable Tohoku Line, the bureau made a request to JR Freight to study setting up a detour for transport of petroleum. JR Freight coordinated with JR East and other railway companies to come up with 	39

	<p>a plan for operating tanker trains along the Sea of Japan side. This led to the transport of approximately 58,000 kiloliters of petroleum (equivalent to roughly 2,900 20-kl trucks) over the course of one month until Tohoku Line service resumed. The delivered petroleum helped alleviate fuel shortages in the afflicted regions.</p>	
<p>Restoration of river levees with priority on relief activities (Tohoku RDB)</p>	<ul style="list-style-type: none"> ● Of the earthquake and tsunami-damaged levees requiring urgent restoration, the bureau gave highest priority to the restoration of road levees that would help relief activities. This approach eliminated isolated areas, decreased long detours and led to the early resumption of transport of relief supplies. 	40
<p>Elimination of bottlenecks by incorporating detour routes into national road districts (Tohoku RDB)</p>	<ul style="list-style-type: none"> ● The washing away of bridges on national roads by the tsunami made it necessary to use prefectural and municipal roads as detours. However, this caused traffic bottlenecks. Consequently, the bureau moved to quickly eliminate bottlenecks by dealing with the prefectural and municipal roads as national roads. 	41
<p>Quick emergency restoration of roads (Tohoku RDB)</p>	<ul style="list-style-type: none"> ● Temporary roads were built in a short periods of time by utilizing emergency negotiated contracts, rapidly ascertaining damage, quickly installing temporary bridges, and constructing temporary embankments on routes having damaged elevated crossings with JR tracks. 	42
<p>Transport of materials in short supply in coastal afflicted areas from inland areas (Tohoku RDB)</p>	<ul style="list-style-type: none"> ● As there was a lack of crushed rock, normal temperature asphalt, and other materials needed for the emergency restoration of afflicted areas, the bureau accelerated restoration by transporting required materials from less damaged areas. 	43

Securing logistics until the final destination

<p>Dispatch of logistics experts to logistics bases in afflicted areas (Road Transport Bureau, Tohoku District Transport Bureau(DTB), Kanto DTB)</p>	<ul style="list-style-type: none"> ● In cooperation with logistics companies, logistics experts were dispatched to Miyagi, Ibaraki, Iwate and Fukushima Prefectures to ensure the smooth transport of supplies from collection bases to evacuation centers (transport for evacuees). These experts played important roles in securing transport to meet the continually changing needs of local evacuation centers. 	44
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<p>Truck transport measures in response to the accident at the Fukushima Nuclear Power Plant (Road Transport Bureau)</p>	<ul style="list-style-type: none"> ● The following initiatives were taken as truck transport measures in response to the Fukushima Nuclear Power Plant accident: <ul style="list-style-type: none"> · The bureau asked the Fukushima Trucking Association to cooperate in transporting supplies to within the existing “indoor evacuation zone” for the Fukushima Nuclear Power Plant. · For truck operation in the “planned evacuation zone” and the “emergency evacuation preparation zone,” the bureau directed the association to engage in appropriate transport activities based on documents that detail important points to remember. · For movement of residents from the “planned evacuation zone,” the bureau prepared a list of businesses of the Fukushima Trucking Association willing to cooperate with evacuation. 	<p>45</p>
<p>Securing warehouses to serve as collection bases for emergency supplies (Logistics Policy Division, Policy Bureau)</p>	<ul style="list-style-type: none"> ● With cooperation from commercial warehousing businesses obtained through the warehousing associations of Iwate, Miyagi and Fukushima Prefectures, the bureau secured warehouses to serve as collection bases for emergency supplies and executed supply storage and sorting operations to ensure that supplies reached evacuation centers smoothly. 	<p>46</p>
<p>Preparation and presentation of route maps to city offices, ports, and other facilities in the afflicted regions (Kanto RDB)</p>	<ul style="list-style-type: none"> ● The bureau prepared detailed maps of accessible routes to municipal offices, ports and other facilities to aid the transport of supplies to Pacific coast areas that received serious tsunami damage. It then made these maps available on the MLIT website. ● The bureau prepared a map showing road conditions around Ibaraki and Kashima Ports as well as a single map showing road closures for roads in its area of responsibility (national roads managed by MLIT, national roads under prefectural jurisdiction and regional roads). These maps were used in the selection and use of routes for transport of emergency supplies. 	<p>47</p>

Efficiently transporting emergency supplies

<p>Alternative transport of railway containers using trucks and ships (Railway Bureau)</p>	<ul style="list-style-type: none"> As the Tohoku Line and other lines were out of service, trucks and ships were used as alternative means of transporting railway containers to Tohoku and Hokkaido. 	48
<p>Flexible transport of relief personnel and emergency supplies by ship (Maritime Bureau)</p>	<ul style="list-style-type: none"> Coastal tankers were used to transport gasoline, light diesel oil and other fuel oils. The bureau made emergency shipments of livestock feed in response to a request from MAFF. 	49
<p>Transport of emergency supplies from the government by truck (Road Transport Bureau)</p>	<ul style="list-style-type: none"> With cooperation from the Japan Trucking Association, the bureau mobilized a total of 1,927 trucks to carry emergency supplies from the government to afflicted areas. This transport played an important role in supporting the daily living of residents in those areas. (18.98 million food items, 4.6 million bottles of drinking water, and other supplies were delivered to a total of 2,032 locations.) The bureau secured necessary fuel supplies at government-designated emergency service stations with a request to the Agency for Natural Resources and Energy. At the present time, the prefectures are handling the procurement and transport of supplies for afflicted areas in accordance with the Disaster Relief Act. 	50
<p>Securing fuel for vehicles transporting emergency supplies (fuel for return trip) (Chubu DTB)</p>	<ul style="list-style-type: none"> In the transport of emergency supplies immediately following the disaster, securing fuel for return trips became problematic due to serious fuel shortages. Consequently, the bureau provided the following instruction on “carrying return fuel” to the trucking associations of the prefectures under its responsibility. The Standards for carrying return fuel of light diesel oil (Fourth Group, Second Class Petroleum) are following; <ul style="list-style-type: none"> Carrying less than the designated volume (1,000 liters) is permitted. Transport must be made in metal drums (certified drums of 250 liters or less per drum) Methodology of transport: 1) to fix drums tightly to prevent serious rubbing and vibration; 2) to load with the opening (lid) to the top; and 3) to install a fire extinguisher if possible. 	51

Responding to various transport demands

<p>Dispatch of vehicles to transport the deceased (Road Transport Bureau)</p>	<ul style="list-style-type: none"> ● With cooperation from the Japan Hearse Association, the bureau mobilized vehicles to transport the deceased in response to requests from the prefectures. 	52
<p>Responses to requests for emergency marine transport of hazardous materials (Hokkaido DTB)</p>	<ul style="list-style-type: none"> ● When hazardous materials requested from afflicted regions were transported by ferry together with relief personnel, the bureau prepared measures to prevent secondary accidents and the minimum necessary safety precautions beforehand, issued recommendations to the requesting parties, and took steps to ensure smooth emergency transport. <p>A specific example is that the bureau created a database of the specifications of the scheduled ships to be used (structure, fire-fighting equipment) and combinations of minimum necessary safety measures and additional precautions for highest-priority hazardous materials. (Highest-priority items are: gasoline, light diesel oil, aviation fuel and etc.)</p>	53

5. Responses to planned power outages and power shortages

Securing passenger transport capability to prevent power shortages from becoming a drag on the economy

<p>Response to railway operations during planned power outages (Railway Bureau)</p>	<ul style="list-style-type: none"> ● Planned power outages have a major impact on the transportation of commuters who go to work and school. Given this, the bureau made a request to the Agency for Natural Resources and Energy to give consideration to railway transportation, and worked with the Tokyo Electric Power Company and the railway companies to keep substations operating and adjust train schedules. ● While requesting power supplies to ensure railway operations, the bureau compiled the operating schedules of the railway companies (which were changing from day to day) and made them available on the MLIT website every day. It also asked the Japan National Tourism Organization (JNTO) through the Japan Tourism Agency to translate train schedules and other information into English for foreigners. 	54
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	<ul style="list-style-type: none"> ● It gathered information on grievances about train tickets and commuter passes through interviews with various companies. It also developed one system for handling grievances and inquiries. 	
<p>Requests concerning operation of railway facilities during planned power outages (Railway Bureau)</p>	<p>The bureau made the following requests to the railway companies regarding energy conservation during power shortages:</p> <ul style="list-style-type: none"> ● Give particular consideration to people with limited mobility, such as people with disabilities and the elderly ● Operate escalators whenever possible. If escalator operation must be terminated, provide prior information on the status of elevator operation at each station wherever possible via websites, etc. Also post guidance for disabled people at ticket gates of stations. ● Regarding lighting within stations, as consideration must be given to people with poor eyesight, determine lighting levels in accordance with conditions at each station in order to ensure that there are no problems. 	55

6. Support for disaster victims and afflicted areas

Accurately ascertaining and immediately responding to the post-disaster needs of victims and afflicted local governments

<p>Active support for local governments through dispatches of liaison personnel (Tohoku RDB, Kanto DTB)</p>	<ul style="list-style-type: none"> ● Local governments along the coast suffered from functional paralysis, as their staffs and buildings were severely affected by the tsunami. In response, senior officials of the Tohoku RDB, who are capable of making onsite decisions, such as vice directors of local branch offices, were dispatched to local governments to serve as liaison personnel. Charged with actively responding to situations as chief assistants of local leaders, these bureau employees quickly ascertained the needs of local governments and executed immediate responses. ● In order to restore and secure transport capability in regions suffering from greatly reduced public transport functions due to numerous impassable sections in railway and local bus networks, the District Transport Bureau dispatched personnel with particularly strong regional 	56
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	<p>knowledge to provide advice to local governments and coordinate with railway operators and automobile transport companies. This effort resulted in the quick establishment of alternative transport networks.</p>	
<p>Procurement of relief supplies that are matched to local government needs (Tohoku RDB)</p>	<ul style="list-style-type: none"> ● Based on the strong leadership of the Minister of Land, Infrastructure, Transport and Tourism, who wanted MLIT personnel to do whatever is necessary regardless of jurisdiction, the bureau procured relief supplies for municipalities because of the needs of afflicted local governments. ● It provided temporary houses, portable toilets, fuel, backhoes and other machinery, daily supplies (diapers, futons, etc.), food items (powdered milk, canned goods, etc.), and other items to local governments. ● The bureau set up a “temporary bulletin board” on its website to relay information on required supplies until full-scale communications could be restored in afflicted local governments. The bulletin board carried information on demand for resupplies in afflicted municipalities and messages from the mayors of these municipalities. 	57
<p>Restoration of communications in local governments afflicted by paralyzed systems (Engineering Affairs Division, Minister's Secretariat, Tohoku RDB)</p>	<ul style="list-style-type: none"> ● An emergency disaster-response system was established with temporary means of communication and information-communication that were secured by deploying K-COSMOS, Ku-SAT, transportable helicopter TV stations, and other technologies. ● Satellite communications vehicles were dispatched to local governments whose communications functions became paralyzed when their telephone lines and mobile phone stations were disabled by the earthquake and tsunami. These vehicles restored communications between the Regional Development Bureau and local governments and between the main offices and branch offices of local governments. ● At a time when communications were paralyzed, early restoration of local governments' communications made it possible to ascertain the damage situation and local 	58

	<p>government needs and precisely execute subsequent assistance for local governments.</p>	
<p>Regional support in safety assessments for damaged housing (City Bureau)</p>	<ul style="list-style-type: none"> ● In response to a request from Miyagi Prefecture, MLIT contacted regional coordinators for damaged housing safety assessments, who are in charge of areas outside the afflicted areas, and asked to find available assessors for Sendai City. For the Tohoku and Hokkaido regions, MLIT organized direct support and secured necessary personnel for prefectures that did not suffer residential damage. It improved the circumstances necessary for assessors to work by asking Miyagi Prefecture to mediate in the arrangement of accommodations and vehicles and give priority to assessors in gasoline rationing. ● The execution of safety assessments helped secure residents' safety by quickly and accurately ascertaining the enormous damage in the residential area of Sendai City and alleviating and preventing the risk of secondary disaster. 	59

Building a framework for receiving consultations from disaster victims and afflicted local governments

<p>Opening of a mobile vehicle consultation center and preparation of a collection of common consultation items (Road Transport Bureau, Tohoku DTB, Kanto DTB)</p>	<ul style="list-style-type: none"> ● A “mobile vehicle consultation center” was established to provide consultation on vehicle-related procedures and free vehicle inspections at evacuation centers for vehicle owners who had suffered damage, such as having their vehicles washed away by the tsunami. ● For people who wished to visit the mobile vehicle consultation center but could not, a leaflet of “frequent asked questions” was prepared based on the content of questions received by the mobile vehicle consultation center. This leaflet was posted on the MLIT website and distributed to evacuation centers so that as many people as possible could be served. 	60
<p>Public buildings consultation desk (Government Buildings Department, Minister's Secretariat)</p>	<ul style="list-style-type: none"> ● The department publicized the existing “public buildings consultation desk” to buildings sections in local government offices. It also addressed needs for damage assessment for local government facilities, advice on 	61

	restoration plan formulation and any other technical assistance.	
Preparation of guidelines for disposal of damaged vessels (Maritime Bureau)	<ul style="list-style-type: none"> ● In order to provide municipalities with information on the owners of damaged vessels in a timely manner, the bureau and Fisheries Agency issued a joint administrative communication noting offices to contact with inquiries and other information. ● The Fisheries Agency and the Ministry of the Environment jointly issued guidelines on the disposal of damaged vessels to concerned local governments. 	62

Providing direct support to disaster victims and evacuees

Provision of accommodations, meals, bathing facilities, etc., to disaster victims using training vessels of the National Institute for Sea Training (Maritime Bureau)	<ul style="list-style-type: none"> ● The bureau used vessels (<i>Ginga Maru</i> and <i>Kaiwo Maru</i>) of the National Institute for Sea Training to transport relief supplies and prepare meals for disaster victims and persons concerned with the nuclear power plants. 	63
Lending of office property (Tohoku RDB)	<ul style="list-style-type: none"> ● Of the many items requested by afflicted local governments, it was the bureau's lending of property in its offices and other facilities that pleased local governments, as it facilitated immediate support at a time of paralyzed logistics and shortened waiting times. This assistance also proved useful in lifesaving operations and the restoration of local government communications. 	64
Assisting evacuees at government buildings (Japan Coast Guard)	<ul style="list-style-type: none"> ● Immediately following the Great East Japan Earthquake, numerous evacuees took refuge at buildings of the 2nd Regional Coast Guard Headquarters, Fukushima Coast Guard Office, Ishinomaki Coast Guard Station, and Kesennuma Coast Guard Station. JCG personnel provided them with places to stay, meals, blankets, and other items as they also executed their search and rescue duties. ● The 2nd Regional Coast Guard Headquarters accepted 1,075 evacuees from March 11th to 16th and when aftershocks occurred on March 28th, April 7th, and April 11th. The Fukushima Coast Guard Office received 15 	65

	<p>people on March 11th, the Ishinomaki Coast Guard Station received 35 people on March 12th, and the Kesenuma Coast Guard Station received 132 people from March 11th to 12th.</p>	
<p>Acceptance of evacuees from other prefectures in accommodation facilities (Japan Tourism Agency)</p>	<ul style="list-style-type: none"> ● In accordance with the Disaster Relief Act, the Japan Tourism Agency matched evacuees to evacuation facilities when evacuees expressed a desire to go outside of their home prefecture. This matching was conducted based on a list of available accommodation facilities that was supplied by the ALL JAPAN RYOKAN HOTEL ASSOCIATION. ● The agency worked closely with MHLW and other concerned government organizations as well as concerned local governments to provide necessary support for the smooth implementation of secondary evacuations in accordance with the desires of disaster victims and afflicted local governments. 	66
<p>Demonstration of the disaster-management functions of roads (Road Bureau, Tohoku RDB)</p>	<ul style="list-style-type: none"> ● The high embankment of the Sendai-Tobu Road (approx. 6 meters) served as a breakwater and the only elevated point in the area. It saved the lives of more than 200 residents who climbed its slopes to escape the approaching tsunami. ● Embankments suppressed the flow of wreckage into inland urban areas. ● The Sanriku Jukan Expressway proved useful as an emergency transport route. Temporary access roads from the expressway to evacuation centers were built in response to local demands. ● On National Route 45, an evacuation stairway was built to the elevated road from an elementary school on the seaward side in response to a request from the community. This stairway played a major role in evacuation from the tsunami. ● Roadside stations called "Michinoeki" functioned as disaster-management centers. 	67
<p>Use of "Michinoeki" and expressway service areas and parking areas as</p>	<ul style="list-style-type: none"> ● Roadside stations called "Michinoeki" served as bases of SDF activities and evacuation centers for community residents. They became important disaster-management 	68

<p>disaster-management centers (Road Bureau)</p>	<p>bases that provided water, food and restroom facilities. Moreover, stations with non-utility generation facilities remained open 24 hours a day even during power outages.</p> <ul style="list-style-type: none"> As for expressway service areas and parking areas, Yotsukura Parking Area and Hanyu Parking Area served as staging bases for SDF and fire department personnel. Fukushima-Matsukawa Parking Area was used as a transport staging base for group transport of evacuees from the area around Fukushima Daiichi Nuclear Power Plant. In addition, 10 service areas were used as consolidation bases for disaster-management equipment. 	
<p>Use of a levee built as an earthquake-proofing measure as an evacuation route (Water and Disaster Management Bureau)</p>	<ul style="list-style-type: none"> A levee built as an earthquake-proofing measure in the Nobiru district (right bank of the mouth to the Naruse River) was undamaged and remained passable by vehicles immediately after the disaster. It was therefore used as an evacuation route by local residents. 	69
<p>Acceptance of people having difficulty returning home (City Bureau)</p>	<ul style="list-style-type: none"> In response to a request from the Tachikawa Police Station, the bureau opened a facility to receive people having difficulty returning home within Showa Commemorative National Government Park (Tachikawa City and Akishima City, Tokyo) as soon as the park's safety was confirmed. There it distributed emergency food items, blankets, and other items that were provided by Tachikawa City and others. After coordinating with the Cabinet Office, the bureau opened the facilities of Tokyo Rinkai Disaster Prevention Park (Koto Ward, Tokyo) for people having difficulty returning home. There it distributed water and blankets that were provided by the Cabinet Office. 	70

Supporting restoration and reconstruction of workplaces and residences

<p>Building of a disaster information network to support afflicted shipbuilding businesses (Maritime Bureau)</p>	<ul style="list-style-type: none"> Studying the damage to shipbuilding-related businesses proved difficult due to lost buildings, severed communications lines, and other problems. Given this, the bureau gathered information on businesses that could not be reached by telephone or other means with the cooperation of ship inspectors affiliated with maritime 	71
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	<p>offices in the afflicted areas. It also obtained and summarized damage information on members of shipbuilding-related business groups that was gathered by those groups. Additionally, it conducted local surveys and questionnaire surveys to determine the status of restoration efforts.</p> <ul style="list-style-type: none"> ● The bureau established a “liaison association of shipbuilding-related industries concerning the Tohoku-Pacific Ocean Earthquake” to hold discussions on efforts to ascertain the status of damage and restoration, requests for assistance, and response to the planned power outages. Members included shipbuilding organizations, fisheries organizations, and labor union organizations. 	
<p>Support for the employment of workers in shipbuilding-related industries and disaster victims desiring reemployment as crewmen (Maritime Bureau)</p>	<ul style="list-style-type: none"> ● In order to engage in broad matching of employers with workers in shipbuilding-related industries with employers, the bureau developed potential employers in collaboration with MHLW. The bureau collected information on job openings from shipbuilding business throughout Japan and promoted broad matching with relevant workers in partnership with job-placement offices (Hello Work). ● For disaster victims who desired reemployment as seafares, the bureau utilized a system to search job openings for seafares throughout Japan and provided fine-tuned employment consultation in partnership with Public Employment Security Offices. 	72

7. Flexible application of procedures and standards

Realizing quicker procedures through increased generality, simplification, and post-operational handling

<p>Greater flexibility in legal procedures concerning notifications for airdrops in relief activities (Civil Aviation Bureau)</p>	<ul style="list-style-type: none"> ● The bureau changed procedures in the following ways to allow greater flexibility for prompt transport of relief supplies to afflicted areas: <ol style="list-style-type: none"> 1) Notifications of airdrops can be made by telephone; and 2) General notifications that do not specify specific airdrop numbers or locations are permitted. 	73
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	<ul style="list-style-type: none"> ● For permission to take off and land at places other than airports and permission to fly below minimum safe altitudes, the bureau allows general permission procedures that do not specify specific times and locations. ● The bureau notified concerned organizations and groups about the above measures. 	
Truck transport measures in response to the Great East Japan Earthquake (Road Transport Bureau)	<ul style="list-style-type: none"> ● Given expectations of insufficient truck transport capacity resulting from truck damage and significant increases in shipments of emergency supplies, the bureau applied various regulations in a more flexible manner as follows: <ul style="list-style-type: none"> · The bureau allows use of rental cars by motor truck transportation businesses in order to secure operations that support reconstruction when disasters occur in afflicted regions and combat vehicle shortages caused by the effects of disasters during summer peak season. · A certain amount of leeway is given in prior notifications for motor truck transportation business that operates places of business in afflicted regions. 	74
Increased flexibility in procedures concerning notifications under the Marine Transportation Act for emergency operation (ships) (Hokkaido DTB)	<ul style="list-style-type: none"> ● The bureau made its handling of operations between Hakodate and Aomori more flexible for response to emergency operations requested by the Ministry of Defense and other organizations as follows: <ul style="list-style-type: none"> · It allowed post-operational handling of prior notices (30 days prior) for irregular operations that are required under Article 20 of the Marine Transportation Act. ● Its response to the Ministry of Defense was premised on the use of existing facilities. ● The bureau's application of greater flexibility in procedures for transport of emergency supplies by high-speed ferry and other vessels was welcomed in Hokkaido. 	75
Increased flexibility in procedures concerning bus operation (Road Transport Bureau)	<ul style="list-style-type: none"> ● The bureau sought greater transport capacity by issuing a notification allowing flexible operation of the entrustment/undertaking of entrustment of management using the vehicles of another company. ● For buses to substitute railway services, concerned transport bureaus implemented faster approval 	76

	<p>procedures for applications for joint service by general chartered passenger vehicle transportation businesses in accordance with Article 21 of the Road Transportation Act.</p> <ul style="list-style-type: none"> ● For chartered buses, the bureau eliminated the necessity of procedures related to the setting of temporary business zones only in cases where operations primarily involve transporting evacuating residents and relief personnel within the afflicted region or between the afflicted region and another region. This move was made in the interest of ensuring greater efficiency in lifesaving and restoration activities. 	
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Changing normal standards in response to emergency situations

<p>Flexible response to vessel navigation zones (Japan Coast Guard)</p>	<ul style="list-style-type: none"> ● In the wake of the accident at the Fukushima Daiichi Nuclear Power Plant, a dangerous area was established in the sea area within a 300-km radius of the plant. However, vessel operators had concerns about operating even in areas outside this zone, and they refrained from sailing due to worries about radiation. ● The area around the plant is extremely important as a transport route to the afflicted areas. Thus, in collaboration with the Maritime Bureau, JCG helped ensure safe and worry-free ship navigation by responding flexibly so as to allow ships using coastal zones (zone roughly within 37 kilometers of the coast) as their navigation zones to navigate beyond the relevant coastal zone and by stationing patrol vessels. 	77
<p>Changing of criteria for issuing weather warnings, forecasts, earthquake information, etc. (Japan Meteorological Agency, Tohoku RDB)</p>	<ul style="list-style-type: none"> ● Given the frequent aftershocks, the Japan Meteorological Agency (JMA) ceased issuing information for individual earthquakes with JMA's seismic intensity of 2 or less and instead issued information on the number of earthquakes. This move was made to facilitate the quick and precise issuance of more important information (e.g., tsunami warnings and information on earthquakes of greater intensity). ● For warnings and advisories concerning torrential rains and floods, alerts concerning possible landslides, and other 	78

	<p>information, they established and began implementing region-specific provisional criteria of issuance for areas affected by earthquakes and tsunamis. These standards are matched to the level of shaking that occurred and degree of damage suffered by levees and other facilities.</p> <ul style="list-style-type: none"> ● By issuing alerts and advisories more quickly, they contributed to disaster preparedness in areas already susceptible to disaster damage. 	
<p>24-hour operation of airports in the Tohoku region (extension of ours of aviation weather operations) (Civil Aviation Bureau, Japan Meteorology Agency)</p>	<ul style="list-style-type: none"> ● With land transport and port functions being lost immediately following the disaster, aircraft played an important role in search and rescue and transport of goods. Thus, the bureau extended 24-hour operations at airports in Fukushima, Yamagata, Hanamaki, and Sendai (after restoration), and the Japan Meteorological Agency extended the time of its weather operations at each airport. These activities helped support aircraft activities. 	79
<p>Building restrictions in accordance with the Building Restrictions Exemption Act (Housing Bureau)</p>	<ul style="list-style-type: none"> ● In accordance with Article 84 of the Building Standards Act, special administrative agencies are permitted to designate specific zones for a period of one month or less from the date of a disaster (with maximum extension up to two months, if applicable), during which they are permitted to restrict or prohibit the building of structures within these zones. This is designed to prevent unregulated building construction in afflicted regions. As a special measure, the Bureau permitted the agencies to restrict or prohibit construction for up to six months from the date of the disaster (with a maximum extension up to eight months, if applicable). In this way, it prevented the construction of buildings that would obstruct the robust restoration of urban areas in the afflicted regions. 	80
<p>Simplification of disaster assessments (Water and Disaster Management Bureau)</p>	<ul style="list-style-type: none"> ● With an eye to accelerating restoration, the bureau issued a notification to local governments ordering the simplification of assessments for disaster restoration works. By issuing the simplification notification, the bureau strove to accelerate restoration while significantly reducing the burden of assessment-related administrative 	81

	<p>work in local governments.</p> <p>Examples of effects are:</p> <p>3) Expanded applicable range of total unit price → Approx. reduce to one-third administrative work</p> <p>4) Expanded desktop assessment amount → Approx. reduce to one-third administrative work</p> <p>5) Simplification of design documents → Approx. reduce to one-tenth administrative work</p>	
<p>Cooperation in alleviating the effects of water and power shortages (Tohoku RDB)</p>	<ul style="list-style-type: none"> Amid continuing water outages, the bureau contributed to efforts to supply water to evacuated residents and provide opportunities for bathing by flexibly applying standards for water intake from rivers. It also contributed to power supply by flexibly operating dams directly under its jurisdiction and increasing the total water intake for hydropower generation by 1.7 times at 16 dams. 	82

8. Reinforcing monitoring and observation systems

Quickly ascertaining damage after a major earthquake

<p>Identification of locations of landslide damage from satellite images (Sabo [Erosion and Sediment Control] Department, Water and Disaster Management Bureau)</p>	<ul style="list-style-type: none"> Using satellite data provided by Japan Aerospace Exploration Agency (JAXA) following the earthquake, the department quickly investigated landslide damage conditions in regions along the Pacific coast where on-land emergency landslide hazard investigations could not be conducted quickly due to the damages by the tsunami or other destructive phenomena. 	83
<p>Application of data from offshore observation points (Japan Meteorological Agency)</p>	<ul style="list-style-type: none"> The first tsunami warning issued following the earthquake estimated a maximum height of six meters. The Japan Meteorological Agency (JMA) subsequently updated this warning based on the observed data from GPS buoys installed offshore. This enabled JMA to provide tsunami warnings with appropriate forecasts before large waves actually hit the coastal areas. 	84
<p>Coordination of tsunami surveys (Japan Meteorological Agency)</p>	<ul style="list-style-type: none"> Following the earthquake, the Japan Meteorological Agency (JMA) took on a management role in early stage for field surveys that were to be conducted by a joint survey team comprised of universities and other organizations, as for when to start. This allowed JMA to 	85

	share information with universities and other concerned organizations. It also allowed it to conduct field surveys by keeping pace with the concerned organizations without imposing a burden on the afflicted areas.	
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Preparing for future disasters

Acquirement of bathymetric data from airborne LIDAR system (Japan Coast Guard, Water and Disaster Management Bureau)	<ul style="list-style-type: none"> ● Predictions of tsunami damage for tsunami countermeasures will be essential when preparing restoration plans in the afflicted areas. Thus, in cooperation with the Water and Disaster Management Bureau, JCG conducted airborne LIDAR system with its own aircraft and acquired the bathymetric data needed to conduct tsunami simulations. ● In implementing the survey, JCG took charge of airborne LIDAR system and data analysis, and the Bureau handled tide observations and studies of seawater transparency on survey days. The acquired data are also being used to correct navigational charts in order to ensure maritime traffic safety. 	86
Restoration and reinforcement of damaged monitoring systems (Japan Meteorological Agency)	<ul style="list-style-type: none"> ● For damaged AMeDAS stations with uncertain restoration schedules, the Japan Meteorological Agency (JMA) restored the system by setting up temporary stations. ● JMA installed transportable monitoring equipments with mobilephones, satellite-link telecommunications, batteries, etc., which can be deployed even in areas where power is out or network is interrupted. ● JMA set up temporary rain-gauge stations to monitor precipitation in small and medium-sized rivers, steep sloping areas, and other locations made more vulnerable to flooding and landslides by the earthquake. ● During the time that tsunami monitoring could not be conducted in the Tohoku region, JMA received reports from patrol vessels stationed along the coast via the 2nd Regional Coast Guard Headquarters. ● For damaged sea-level and tsunami observation facilities, JMA quickly set up temporary observation points and began observations. 	87

<p>Three measures to reduce flood damage (Tohoku RDB)</p>	<ul style="list-style-type: none"> ● To reduce flood damage caused by the complete destruction of drainage pumping stations and regional ground subsidence that resulted from the earthquake and tsunami, the bureau 1) provided quick and mobile support by deploying drainage pump vehicles over a wide area and, as non-physical measures, 2) made flood risk maps available to the public and 3) provided information via e-mail from flood sensors it set up. ● The bureau thus substantially supplemented drainage capacity that had deteriorated due to damage to drainage pump stations. Moreover, the real-time “flood information e-mail” system it set up proved effective in providing reference information needed when studying measure during floods, including quick responses to flooding, flood prevention activities, and announcement of evacuation information. 	<p>88</p>
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