Kick-‘em-Jenny Submarine Volcano Eruption Timeline

Updated 2nd December, 2019

23rd-24th July, 1939

The presence of the volcano was first revealed by an eruption which occurred on July 23rd-24th, 1939. It was witnessed by a large number of people in northern Grenada including a well-known Grenadian historian, Fr. R.P. Devas, who wrote a two-page typescript account of the eruption, a copy of which is at the Seismic Research Centre.

This eruption lasted for at least 24 hours and at its height it ejected an eruption column 300 metres (900 feet) above sea level. The eruption generated a series of sea waves which had amplitudes of about 2 meters in northern Grenada and the southern Grenadines.

Since 1939 there have been at least thirteen more eruptions of Kick-'em-Jenny. None of these have been as big as the 1939 eruption and most have been detectable only by seismographs. The most recent eruption of the volcano occurred in April 2017.

4th-6th December, 2001

Elevated activity at Kick-'em-Jenny occurred between December 4th and 6th, 2001. It was the first active episode to be preceded and accompanied by genuine volcanic earthquakes since seismograph networks were established in the Eastern Caribbean in 1952. The first signs of the underwater volcano's unrest were observed on September 24th, 2001 with a premonitory earthquake directly beneath the volcano. On December 4th, scientists at the Seismic Research Centre (then ‘Unit’) observed a burst of seismic activity beginning at 6:00AM (local time) and increasing to a peak at about 11:00AM. Following a short lull, activity again increased, and culminated in bursts of "T-phase*" between 7:18PM and 10:31PM. These bursts of T-phase were interpreted as explosions associated with a submarine eruption. After this burst of activity things quieted down, and earthquake activity returned to background levels.

The December 4th eruption appeared to have been completely submarine, with no observed or reported activity at the surface (although it did occur at night, so we cannot say for sure that there were no surface manifestations). Despite the lack of subaerial activity, the presence of T-phase confirmed that Kick-'em-Jenny had erupted. The largest earthquakes associated with the eruption were felt in northern Grenada.

* T-phase, also known as "T-wave" is an acoustic wave from an earthquake or underwater explosion (e.g. submarine volcanic eruption). When an earthquake occurs in the earth's crust under the ocean or a submarine volcano erupts, in addition to the usual earthquake waves - i.e. "P" (primary) and "S" (secondary) waves - a third wave (T-wave) is generated by the acoustic energy in the ocean. The "T" stands for "tertiary", because these waves travel the slowest and so arrive after both the P and S waves at seismic stations.

Hourly (red bar chart) and cumulative (continuous line) numbers of volcanic earthquakes recorded at GRW from 6:30 AM, Dec. 4 to 6:30 AM, Dec. 6, 2001. Vertical arrows are T-phase episodes.

23rd-24th July, 2015

On 23rd July, 2015 at 01:42 a.m. (local time) a strong, continuous signal was recorded on the GCMP and GRGR seismic stations, which are located at Mt. Pleasant, Carriacou and Meribu, Grenada respectively, that lasted until about 02:58 a.m. local time. Based on the strong T-phase signals that were recorded at seismic stations in Montserrat, the signal was interpreted to be an eruption from the Kick-'em-Jenny volcano. A second eruption, which lasted about an hour, was recorded the following morning, 24th July, from 00:02 a.m. These eruptions were the culmination of volcanic unrest at the volcano that began on 11thJuly 2015 with two earthquakes of volcanic origin and steadily increased. Following the eruptions, volcanic seismicity rapidly subsided to background.

29th April, 2017

The eruptive activity on 2017/04/29 is among the shortest ever recorded at the Kick-'em-Jenny; it consisted of one eruption, which lasted just 14-minutes, followed by tremor lasting about an hour. The period of unrest began on 8th April with one KeJ earthquake. On the days following that first event and prior to the eruption the daily number of earthquakes was in the range 0-2, with 16 in all leading up to the eruption. After the eruption, there was a sharp increase in the output rate, with an additional 84 events up to the 2nd May, after which the earthquake activity ceased. The eruption was felt in northern Grenada and Martinique as an extended period of shaking. There was no surface evidence of the occurrence of the eruption.

The 2015 eruption episode was similar to that of 2001 only in the high level of precursory earthquakes and rapid decay of post-eruption seismicity. There were, however, only two eruptions, separated by approximately 24-hours, both lasting about an hour. The 2017 eruption episode was unique; the precursory seismicity was low level; the eruption occurred without intensification of precursory seismicity and the post-eruption seismicity was relatively abundant, but short-lived. The type of earthquakes seen following the 2017 eruption was different from those in 2001, 2015 and the precursory earthquakes in 2017. This difference along with the low level of precursory 2017 events may signal changes in the KeJ conduit and crater that may influence the activity seen in the next eruption episode; a pattern similar to that prior to 2001.